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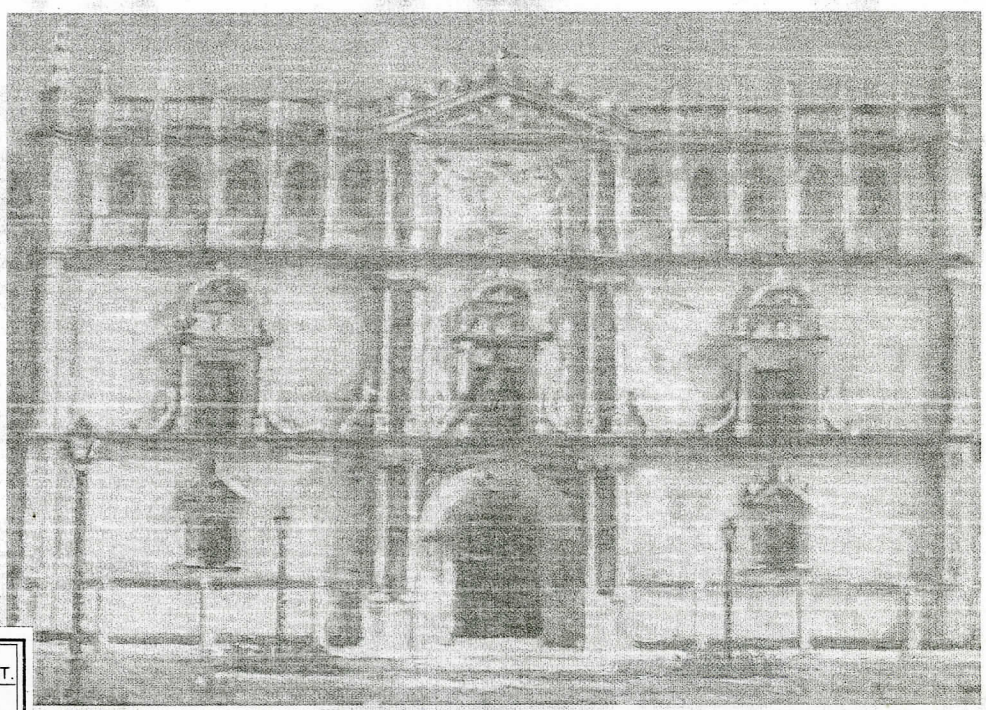

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"THE ARCHAEOBOTANICAL ARCHIVE: PLANTS USED BY MAN (WHICH, WHERE, HOW, WHEN?)"

WHAT FRUITS DID ROMANS EAT IN EMILIA ROMAGNA (NORTHERN ITALY)? SOME RESPONSES FROM SEEDS AND FRUITS

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1. INTRODUCTION

In the last ten years, an increasing number of studies concerning seeds and fruits recorded in archaeological sites of the Emilia Romagna region were carried out thanks to the co-operation between our laboratory and the Soprintendenza Archeologica. The archaeological sites involved dated from the Neolithic to the Modern Age. On the whole, the seeds and fruits studied were several hundred thousands and their floristic list includes hundreds of species/carpological types. Many of them belong to plants producing 'fruits' (in the common – not strictly botanical - sense of the word). In the Roman times, these records increased suggesting that fruit became an important and habitual food on the tables of Emilia Romagna, during that period. This paper presents a brief review of the 'fruit' records found in 11 archaeological sites of the region dated in the Roman period, based on published and unpublished data. Other information and references can be found in a more detailed paper [1].

2. MATERIALS ANS METHODS

The eleven sites are located in six provinces: Bologna (4 sites), Modena (3), Ferrara (1), Parma (1), Reggio Emilia (1) and Ravenna (1). Deposits were: drained channels, necropolis, deposit-wells, *villae*, votive sites, etc. Chronology, based on archaeological data and C^{14} datings, ranged from the 2nd cent. BC to the 7th cent. AD. The records were subdivided in 3 phases: 1) 'Repubblicana', present in two sites dated II-I cent. BC; 2) 'Imperiale', present in six sites dated I-IV cent. AD; 3) 'Tardo antica', present in four sites dated V-VII cent. AD. Sampling methods ranged from collection with the naked eye to water sieving/floating. Tab.1 shows the floristic list and the quantity of the records studied; Tab.2 shows the concentrations (seed/fruit per litre), available for six sites. Botanical names are taken from the Flora d'Italia [2] or European Flora [3].
Photographs of some specimens are represented in Plate I (for specimen sizes see below, paragraph 3.1).

3. RESULTS

Altogether, 23 infrageneric taxa plus 2 deteriorated types (Pomoideae undiff. and *Sorbus* sp.) were recognised (Tab.1), accounting for ca. 1/10 of all carpological taxa of the Roman period. Cultivated and probably cultivated taxa (hereinafter = cultivated) prevailed (16 cultivated - versus 7 wild taxa). Among the first, 8 were native to Italy, and possibly domesticated in the region, 4 were exotics, introduced for food, ornament etc.; it is uncertain whether the other 4 taxa are native or exotics.

3.1. The Floristic List

All the taxa are listed below in alphabetical order per genus, with some notes on the records and the parent plants [4, 2, 5, 6, 1]:

***1. Citrullus lanatus* (Thunb.) Mats. & Nakai** (watermelon – CUCURBITACEAE; specimen size = 6,5 mm): it was recorded only in Site 1 of the 'Imperiale' phase. Wild forms of watermelon are present in desert lands of southern Africa. In Italy, it is exotic and cultivated.

***2. Cornus mas* L.** (cornelian cherry – CORNACEAE; specimen size = 10 mm): it was recorded in the 'Repubblicana' and 'Imperiale' phases, in the latter very abundant in Site 3. It is native to Italy and Emilia Romagna; currently it grows wild but it is rare, and it is cultivated here and there.

***3. Corylus avellana* L.** - (hazel – CORYLACEAE; specimen size = 22.7 mm): it was present in all three phases, sometimes abundant in the 'Imperiale'. It is native to Italy and

Emilia Romagna; currently it grows wild and it is also cultivated. Several doubts still exist about chronology and geographical area of its domestication, which probably occurred in Roman times.

***4. Crataegus* cf. *monogyna* Jacq.** (hawthorn – ROSACEAE; specimen size = 5 mm): it was recorded only in the 'Tardo antica' phase. It is a common wild species in Italy and Emilia Romagna.

***5. Ficus carica* L.** (fig – MORACEAE; specimen size = 1.7 mm): it was recorded in all three phases, mainly in the two older ones. In Italy, the fig grows probably wild only in the Mediterranean area, but it is largely cultivated and naturalised also in the North. In Emilia Romagna, its records probably date back to the Bronze age, suggesting an ancient tradition of anthropic care for this plant.

***6. Fragaria vesca* L.** (strawberry - ROSACEAE; specimen size = 1.2 mm): it was found in the 'Repubblicana' and 'Imperiale' phases, very abundant in the former. Currently, in Italy, this species grows wild, besides being widely cultivated; its domestication is thought to have started in Europe in the XIV-XV cent. AD. However, its abundant records in the Site 1 (Cassa di Risparmio - Parma - II cent.AD) where its pollen was also found, suggest that strawberry could have been cultivated or looked after by people (see below).

***7. Juglans regia* L.** (walnut - JUGLANDACEAE; specimen size = 35 mm): it was recorded in the last two phases. It is native in various countries of Asia and Europe; in the latter, in Italy and Balkan Peninsula. It is thought to have been first domesticated in Turkey, Caucasus and Iran, probably since the II millennium BC. Currently in Italy it is cultivated and also naturalised. Our Roman records indicated cultivated forms.

***8. Malus domestica* Borkh.** and ***9. Pyrus communis* L.** (apple and pear – ROSACEAE; specimen size = 5.5 and 6 mm): apple was recorded in all three phases, pear in the last two. They were probably domesticated in different European countries; today are known only as cultivated plants.

***10. Pinus pinea* L.** (stone pine – PINACEAE; specimen size = 17 mm): it was recorded only in the 'Imperiale' phase. It is not sure whether the species is native to Italy, where currently it is widely cultivated and naturalised. Its cultivation in the Roman period is well-known.

11. Prunus avium L. (sweet cherry - ROSACEAE; specimen size = 10 mm): it was recorded in all three phases, particularly in the 'Imperiale' and abundant in Site 3. It is native to Italy, where currently it is widely cultivated and also naturalised. Our Roman records indicated cultivated forms.

***12. Prunus cerasifera* Ehr.** (cherry plum – ROSACEAE; specimen size = 18.3 mm): it was recorded only in the 'Imperiale' phase. It is native to the Balkan Peninsula and Crimea. In Italy, it is exotic and cultivated.

13. Prunus domestica L. subsp. ***domestica*** and ***14. P. domestica*** L. subsp. ***insititia*** (European plum and bullace - ROSACEAE; specimen size = 22.5 and 14 mm): they were both recorded in the 'Imperiale' phase; the bullace in the 'Tardo antica' too. The origin of the species is dubious; it is supposed to be derived from a hybridization between *P. spinosa* - tetraploid and *P. cerasifera* –diploid (the latter not native in Italy) and to grow currently wild in western Asia. The two subspecies are cultivated in Italy.

***15. Prunus dulcis* (Miller) D.A.Webb** (almond – ROSACEAE; specimen size = 18 mm): few records were found only in the 'Imperiale' phase. The origin of the species is dubious, possibly in various countries between in Western Asia and Marocco. Currently it grows wild in the Levant. It is exotic and cultivated in Italy.

***16. Prunus mahaleb* L.** (perfumed cherry – ROSACEAE; specimen size = 7 mm): few records were found only in the 'Imperiale' phase. It is native to Italy where it currently grows wild.

17. Prunus persica (peach - ROSACEAE; specimen size = 23 mm): it was recorded especially in the 'Imperiale' (Site 3) and in the 'Tardo antica' phases. It is native to East Asia. In Italy it is exotic and cultivated.

***18. Prunus spinosa* L.** (blackthorn – ROSACEAE; specimen size = 9 mm): few records were in the 'Imperiale' and 'Tardo antica' phases. It is a native to Italy and Emilia Romagna where it currently grows wild.

19. Rubus fruticosus s.l. (blackberry – ROSACEAE; specimen size = 3.2 mm): it was recorded in all three phases, most abundant in the 'Tardo antica' (Site 11). This

carpological type includes a number of species native to Italy and Emilia Romagna where they currently grow wild.

20. Sambucus nigra **L.** (elderberry – CAPRIFOLIACEAE; specimen size = 4 mm): it was recorded in the 'Repubblicana' and in the 'Tardo antica' phases, mainly in the latter and especially abundant in Site 11. It is native to Italy and Emilia Romagna where it grows wild.

21. Sorbus domestica **L.** (true service– ROSACEAE; specimen size = 7 mm): few records were found in the last phase. It is native to Italy and Emilia Romagna, where currently it is wild and also cultivated.

22. Sorbus **cf.** ***torminalis*** **(L.) Crantz** (wild service – ROSACEAE; specimen size = 4.5 mm): records were found in the first phase. It is native to Italy and Emilia Romagna, where it currently grows wild.

23. Vitis vinifera **L.** subsp. ***vinifera*** (grape vine - VITACEAE; specimen size = 6.2 mm): It was frequent and sometimes abundant in all three phases. The ancestor wild grape (*V. vinifera* subsp. *sylvestris*) is native and grows wild in Italy. Our Roman records indicated cultivated grape vine.

4. Discussion - The fruit from the 'Repubblicana' to the 'Tardo antica' phases

The main characteristics of the three chronological phases of the Roman period are considered below.

4.1. 'Repubblicana' phase (chronology of records: II-I cent. BC; 2 sites; 11 taxa)

Fruit types were 11. Cultivated fruit slightly prevailed (7 taxa). Five of them were surely cultivated: *Vitis vinifera* subsp. *vinifera* and *Ficus carica,* the most frequent and abundant, joined by *Malus domestica, Pyrus communis* and *Prunus avium*. The other two, *Fragaria vesca*, and *Cornus mas* were possibly cultivated or in a pre-cultural status. Actually, this seemed especially true for strawberry, abundant in Site 1, while cornelian cherry appeared cultivated mainly in the following phase (see below). Note that no exotics were present in this phase; all cultivated fruit belonged to species native to Italy and Emilia Romagna (with some doubt for the fig which had possibly been introduced long before – see above). Four taxa were of wild fruits (*Rubus fruticosus* s.l., *Sorbus* cf. *torminalis*, *Corylus avellana* and *Sambucus nigra*).

4.2. 'Imperiale' phase (chronology of records: 15/40 AD – I-IV cent. AD; 6 sites; 18 taxa)

Fruit was the most various (18 taxa) due to the doubling of the cultivated types (14 taxa) which included, besides the previous ones -only *Pyrus communis* was missing-, several other Prunoideae (*Prunus persica*, *P. cerasifera, P. dulcis*, *P. domestica* subsp. *domestica* and *P. domestica* subsp. *insititia*, plus *Juglans regia*, *Pinus pinea* and *Citrullus lanatus*). *Fragaria vesca* was rare now and the anthropic care not evident, while *Cornus mas* appeared cultivated, abundant in Site 3. Note that more than half new fruits were exotics (4: *Prunus persica*, *P. cerasifera, P. dulcis* and *Citrullus lanatus*) There were again 4 taxa of wild fruits but *Sorbus torminalis* and *Sambucus nigra* had disappeared while two wild Prunoideae (*Prunus spinosa* and *P. mahaleb*) appeared. The general interest in Prunoideae in this phase is worth noting.

4.3. 'Tardo antica' phase (chronology of records: end of V-VII cent. AD; 4 sites; 13 taxa)

The variety of fruit decreased (13 taxa), precisely the cultivated ones (8 taxa), whereas wild fruit was almost as various as before (5 taxa versus 4). Only *Prunus domestica* subsp. *insititia* and *P. persica* remained among Prunoideae. The latter was the only exotic. Altogether, fruit seemed neglected in this phase.

5. Conclusions

In the Roman period a considerable variety of fruits was present on the tables of our region.

In the 'Repubblicana' phase, people eat wild and cultivated fruit, the latter belonging to species which were all native to the region (with some doubt for the fig). People were not used to exotic fruits. The fruit basket displayed 11 types (7 cultivated and 4 wild). Grape, fig, and strawberry emerged in it. Nuts did not seem particularly appreciated in this phase, being represented only by hazelnut.

In the 'Imperiale' phase there was novelty on the table with richer fruit. In fact, besides the previous types, which continued to be more or less eaten (only pear was missing),

several new fruits were tasted (8 taxa, a third of all types recorded), including two nuts (walnut and pine kernel) and four exotics (almond, cherry plum, peach, watermelon). The fruit basket was larger now, with 18 types (14 cultivated and 4 wild). Exotics characterised this phase, as well as the variety of Prunoideae (7 taxa: versus 1 and 3 taxa in the other phases).

In the 'Tardo antica' phase, fruit was less present on the table. Abundance and variety decreased; only one exotic remained (peach). Grape, walnut and elderberry emerged. The decline of the cultivated fruit was certainly due to the decline of the central power and to the subsequent wars which disturbed and broke off agriculture.

These records suggested: 1) people were used to collecting more or less the same wild fruit in all phases. In fact wild fruit was recorded in all sites and its variety remained similar, with limited renewals (4, 4, 5 taxa, 7 altogether). Remember, however, that in some cases it is not sure whether fruits were collected or naturally fell in the deposits; 2) cultivated fruit was dominant throughout in all phases, but it was really important in the imperiale phase (7, 18, 8 taxa; 16 altogether); 3) fig and grape emerged in all phases, especially grape, while fig seemed to decrease over time; 4) cultivated fruit was mainly produced by native plants in all phases (altogether 10 native taxa plus 4 dubious: fig, stone pine, European plum, bullace) while exotic fruit was a character of the 'Imperiale' phase (0, 4, 1 taxa; 4 taxa altogether); 5) fruit was most probably cultivated locally; some doubts remain for watermelon and almond which could have been imported.

All things considered, the 'Imperiale' phase appeared to have been the period of the emergence of fruit on the tables of our region and "orchards" on its landscape. It was also the time when the habit of eating exotic fruit spread; the diffusion of peach, now a customary fruit on our table and a common orchard in the landscape, may have its roots in the Roman period.

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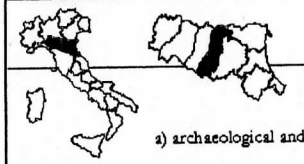
Table 1 – Capological data: presence of "fruit" records in 11 Roman sites of Emilia Romagna



	Sites	Parma Cassa Risparmio - PR		Modena Banca Italia - MO	Modena centro - MO	Luogo Pozzo - Medicina - BO	Voghenza - FE	San Vitale - BO	Russi - RA	Castaldobola - BO		Barzano - BO	Rubiara - RE	Cognanto - MO
		1		2	3	4	5	6	7	8		9	10	11
	Chronology a) archaeological and b) C^{14} dating	'Repubblicana'			'Imperiale'							'Tardo antica'		
		II cent. B.C.[a]		I-I cent. B.C.[a]	15-40 A.D.[a]	I cent. A.D.[a/b]	second half of I - first half of III cent. A.D.[a]	I-IV cent. A.D.[a]	I-IV cent. A.D.[a]	IV cent. A.D.[a]	VI cent. A.D.[a]	end of V - beginning of VI cent. A.D.[a]	VI cent. A.D.[a]	VI-VII cent. A.D.[a]
	type of deposit	votive sites		cone booming	drained channel	buildings	necropolis	wells	kitchen's well (wells)	wells		hiding well	hiding well	hiding well
CAPRIFOLIACEAE	*Sambucus nigra* L.	C											C	CCC
CORNACEAE	*Cornus mas* L.	C	C		CCC				C					
CORYLACEAE	*Corylus avellana* L.	C			CC				CC				C	C
CUCURBITACEAE	*Citrullus lanatus* (Thumb.) Mansfeld				C									
JUGLANDACEAE	*Juglans regia* L.				CC		C		CC	C	C	C	CC	CC
MORACEAE	*Ficus carica* L.	CCC	CCCC	CC	CCC			C		C			C	CC
PINACEAE	*Pinus pinea* L.				CC		C		CC					
ROSACEAE	*Crataegus monogyna* Jacq.													C
	Fragaria vesca L.	CC	CCCC			C								
	Malus domestica Borkh.	C	C							C			C	C
	Pomoideae undiff. (deteriorated)		C											C
	Prunus avium L.			C	CCC				C					
	Prunus cerasifera Ehrh.				C									
	Prunus domestica L. subsp. *domestica*				C									
	Prunus domestica L. subsp. *insititia*				C									C
	Prunus dulcis Miller D.A. Webb				C									
	Prunus mahaleb L.									C				
	Prunus persica (L.) Batsch				CCC				CC			C	C	
	Prunus spinosa L.								C					C
	Pyrus communis L.	C											C	C
	Rubus fruticosus s.l.	C	CC	C	CC									CCC
	Sorbus domestica L.													C
	Sorbus sp. (wild)	C	C											
	Sorbus torminalis (L.) Crantz		CC											
VITACEAE	*Vitis vinifera* L. subsp. *vinifera*	CCC	CCC	C	CCCC			C		CCCC	CCC		CC	CCC

Seeds / Fruits	C - from 1 to 9	CC - from 10 to 99	CCC - from 100 to 999	CCCC - over 1000

Table 2 – Carpological data: concentrations of records of the 'fruit' (n° per litre) from 6 archaeological sites (where information was available)

Sites		1	2	4	6	8		11
		Records/1 litre						
CAPRIFOLIACEAE	*Sambucus nigra* L.	1						23,13
CORNACEAE	*Cornus mas* L.	1,00						
CORYLACEAE	*Corylus avellana* L.	1,00						0,10
CUCURBITACEAE	*Citrullus lanatus* (Thumb.) Mansfeld							
JUGLANDACEAE	*Juglans regia* L.					0,29	0,18	0,63
MORACEAE	*Ficus carica* L.	138,00	7,64		0,04	0,16		1,10
ROSACEAE	*Crataegus monogyna* Jacq.							0,10
	Fragaria vesca L.	65,00		1,43				
	Malus domestica Borkh.	3,00				0,19		0,20
	Pomoideae undiff. (deteriorated)							0,13
	Prunus avium L.		1,27					
	Prunus domestica L. subsp. *insititia*							0,10
	Prunus mahaleb L.					0,10		
	Prunus spinosa L.							0,30
	Pyrus communis L.	9,00						0,30
	Rubus fruticosus s.l.	1,00	1,91					7,30
	Sorbus domestica L.							0,15
	Sorbus sp. (wild)	4,00						
VITACEAE	*Vitis vinifera* L. subsp. *vinifera*	179,00	3,82		0,22	127,99	10,29	3,25
TOTAL		**402,00**	**14,64**	**1,43**	**0,26**	**128,73**	**10,47**	**36,79**
% Fruit out of the total records per each sample		*63,7*	*69,7*	*0,8*	*1,8*	*74,9*	*24,5*	*23,8*

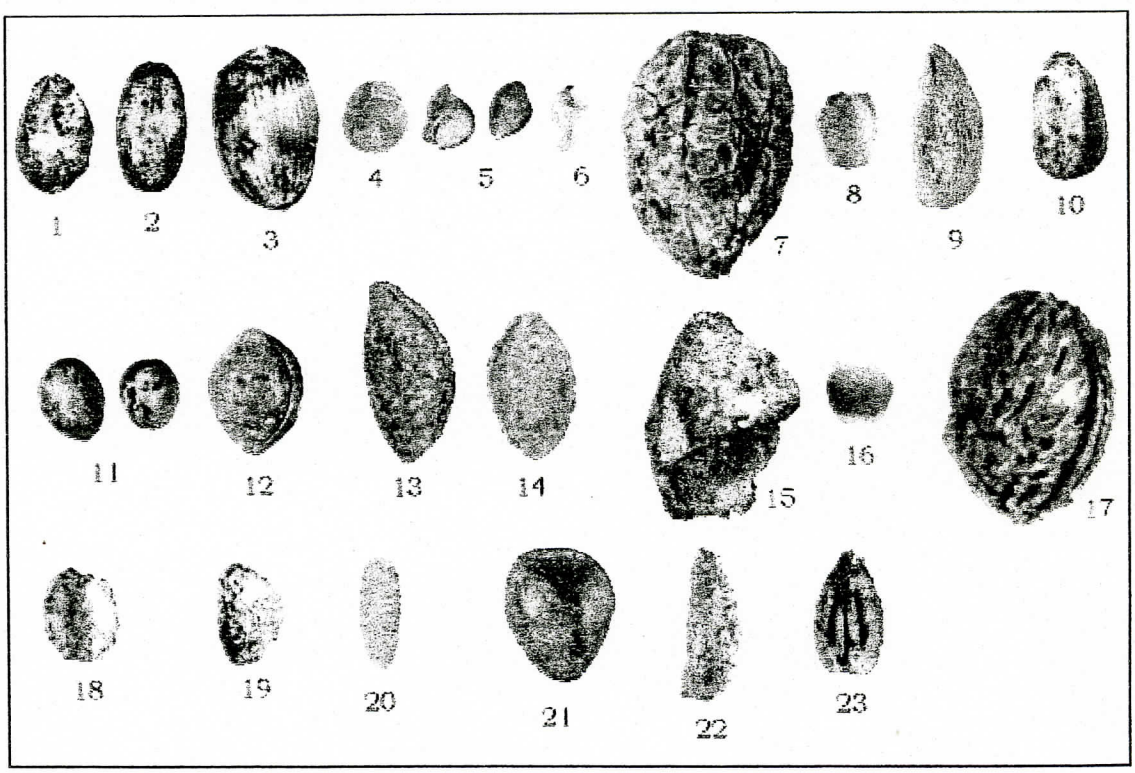


PLATE I – Photos of 'fruit' records from Roman sites of Emilia Romagna (for number, name and size - see paragraph 3.1)