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(Calderara di Reno, Bologna - Northern Italy; 30 m a.s.l.)**

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*Estratto da:*

ALLIONIA volume 34

Bollettino del Dipartimento di Biologia Vegetale dell'Università di Torino

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## POSTER

## The Holocene sequence of the Cava Olmi (Calderara di Reno, Bologna - Northern Italy; 30 m a.s.l.)

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L. Forlani, S. Marvelli, A. Mancini, M. Marchesini. **The Holocene sequence of the Cava Olmi (Calderara di Reno, Bologna - Northern Italy; 30 m a.s.l.).** *Allionia* **34**: 357-362, 1996.

A study of palynological samples and xylological remains of the Cava Olmi (Calderara di Reno, Bologna, Northern Italy, 30 m a.s.l., 44°32'N 11°17'E) reveals a continuous Holocene sequence, supported by one radiometric <sup>14</sup>C (6350-6150 BP).

**RIASSUNTO. La sequenza olocenica della Cava Olmi (Calderara di Reno, Bologna - Nord Italia; 30 m s.l.m.).**

Uno studio riguardante campioni palinologici e reperti xilologici, condotto nella Cava Olmi (Calderara di Reno, Bologna - Nord Italia; 30 m s.l.m.; 44°32'N 11°17'E) documenta sui cambiamenti vegetazionali avvenuti durante l'Olocene. Tale indagine è stata supportata da una datazione radiometrica <sup>14</sup>C (6350-6150 BP).

### Site description

The Cava Olmi (30 m a.s.l.; 44°32'N 11°17'E), which belongs to the Consorzio Cave s.r.l.,

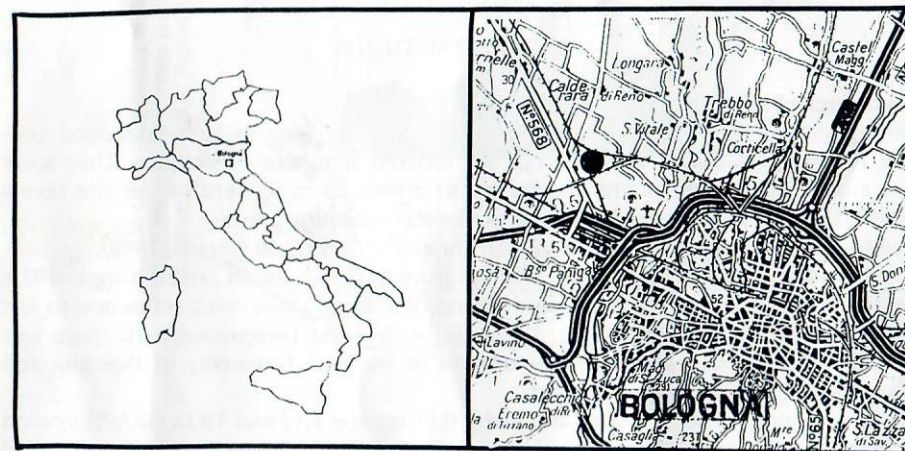


Fig. 1 - Map showing the position of the Cava Olmi.







non-arboreal pollen, AP+NAP) excluding the Pteridophyta.

#### - Xylological samples

The xylological samples were collected from a level of gravels and middle - light sands characterized by crossed stratification (between -4/-8,9 m) and from a level of grey clays (-17/-18 m). The results presented in this paper (Tab. 1) refer to 78 so far analyzed xylological samples (Jacquiot *et al.*, 1973; Schweingruber, 1990).

#### - Radiometric <sup>14</sup>C

The time scale of the Cava Olmi sequence has been supported by one radiometric <sup>14</sup>C, carried out by ENEA Laboratories - Bologna. The radiocarbon date, measured on deciduous *Quercus* (belonging to level -4/-8,9 m), assigned an age of 6350-6150 BP, calibrated according to Stuiver and Reimer (1993).

For the Holocene the major stages are defined using the classical European terminology (Reille and de Beaulieu, 1988).

depth (m)	4 - 8,9	17 - 18
<b>Acer campestre L.</b>	<b>3</b>	
<b>Acer sp.</b>	<b>1</b>	
<b>Alnus glutinosa (L.) Gaertn.</b>	<b>4</b>	
<b>Crataegus sp.</b>	<b>1</b>	
<b>Fagus sylvatica L.</b>	<b>1</b>	
<b>Juglans regia L.</b>	<b>2</b>	
<b>Pinus sp.</b>		<b>4</b>
<b>Populus sp.</b>	<b>10</b>	
<b>deciduous Quercus</b>	<b>33</b>	
<b>Salix sp.</b>	<b>3</b>	
<b>Sorbus sp.</b>	<b>2</b>	
<b>Ulmus sp.</b>	<b>14</b>	

Tab. 1 - Xylological remains.

## RESULTS AND DISCUSSION

The pollen and xylological records of the Cava Olmi provide a continuous Holocene sequence and five distinct zones have been detected as reported below.

### COP1 - Preboreal (10.300 - 9000 yrs. BP)

Depth : 19-17 m

Pollen and xylological samples

Maxima APF : 9833 grains/g

AP percentage values : 75,6 (57,5 - 86,3)

Taxon with greatest frequency : *Pinus sylvestris* type

This phase is characterized by a local Pine tree forest, taking into account the pollen frequency and the xylological remains (4) and by the modest frequency of the deciduous trees.

### COP2 - Boreal (9000 - 8000 yrs. BP)

Depth : 16-11 m

Pollen samples

Maxima APF : 3795 grains/g

AP percentage values : 50,8 (42,5 - 63,0)

Taxa with greatest frequencies : *Corylus* and *Pinus*

Two subzones can be distinguished: the first one is marked by the prevalence of *Corylus*, whose expansion corresponds to the regression of *Pinus*, the second is characterized by the expansion of mesic arboreal vegetation (deciduous *Quercus*, *Ostrya carpinifolia* / *Carpinus orientalis* and *Ulmus*) and a warming trend.

### COP3 - Atlantic (8000 - 4700 yrs. BP)

Depth : 10-6 m

Pollen and xylological samples

Maxima APF : 1820 grains/g

AP percentage values : 53,2 (41,8 - 64,5)

Taxa with greatest frequencies : *Tilia* and *Abies*

This period is characterized by two different subzones: the first one is marked by the progressive decline of *Corylus* accompanied by the expansion of *Tilia cordata* Miller; the second one by the dominance of *Abies*.

This suggests a process related to an increase in precipitation at the end of the Atlantic, also confirmed by the xylological remains (*Alnus glutinosa* (L.) Gaertner, *Populus* and *Salix*).

### COP4 - Subboreal (4700 - 2600 yrs. BP)

Depth : 5-3 m

Pollen samples

Maxima APF : 1300 grains/g

AP percentage values : 43,7 (39,2 - 43,7)

Taxa with greatest frequencies : deciduous *Quercus*, *Abies* and Gramineae

During this phase the AP considerably decreases: the dominant plants are, in chronological order, deciduous *Quercus*, *Abies*, accompanied by *Corylus*, *Ostrya carpinifolia* / *C.orientalis*, *Tilia* and *Ulmus*. The expansion of Gramineae, particularly cereals (*Avena* - *Triticum* group: 1,7%) is well represented.



**COP5 - Subatlantic (2600 yrs. BP - today)**

Depth : 2-1,5 m

Pollen samples

Maxima APF : 4175 grains/g

AP percentage values : 26,7 (12,0 - 41,3)

Taxa with greatest frequencies : Gramineae and Cichorioideae

The anthropogenic decline of the AP marks this period. It seems that the decrease of the mesohygrophilous trees, which favoured first the Gramineae and the Cichorioideae, then the cereals cultivation, corresponds to clearing and pastoral activity.

Informations obtained from the sequence of the Cava Olmi are remarkable: they give us a continuous Holocene sequence in Po valley.

In the first part of the diagram *Pinus* predominates, then we have the expansion of mixed oak woods; the anthropic intervention prevails in the upper part (Bertolani Marchetti, 1989; Bertolani Marchetti *et al.*, 1970; Dallai *et al.*, 1989).

Key words: Palynology, xylology, Holocene, Northern Italy

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