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► **To cite this version:**

Jordi Revelles, Matthieu Ghilardi. 50. Piantarella (south Corsica, France). Grana, 2021, 60 (3), pp.239-242. 10.1080/00173134.2020.1822440 . halshs-03126598

HAL Id: halshs-03126598

<https://shs.hal.science/halshs-03126598>

Submitted on 7 Dec 2021

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CONTRIBUTIONS TO THE EUROPEAN POLLEN DATABASE

Piantarella (South Corsica, France)

JORDI REVELLES^{1,2} MATTHIEU GHILARDI³

¹Institut Català de Paleocologia Humana i Evolució Social (IPHES), Zona Educacional 4, Campus Sescelades URV (Edifici W3), 43007 Tarragona, Spain.

²Universitat Rovira i Virgili (URV), Àrea de Prehistòria, Avinguda de Catalunya 35, 43002 Tarragona, Spain.

³CEREGE, Aix Marseille University, CNRS UMR 7330, IRD, Collège de France, INRA, Europôle de l'Arbois BP 80 13545, Aix-en-Provence, CEDEX 04, France.

Site details

The study site, l'étang de Piantarella, is located in Bonifacio, on the southern coast of Corsica (France). Three cores were extracted: Piantarella 1 (630 cm, WGS84: 41°22'29.34"N/9°13'12.62"E, 0.36 m a.s.l.); 2 (315 cm, WGS84: 41°22'23.61"N/9°13'14.64"E, 0.33 m a.s.l.); 3 (420 cm, WGS84: 41°22'31.10"N/9°13'11.32"E, 0.19 m a.s.l.). The climate of South Corsica is Mediterranean and the region is included within the meso/thermo-Mediterranean vegetation belt, under a semi-arid bioclimate according to Emberger's classification (Emberger, 1930), with an annual precipitation of *ca.* 542 mm and a mean annual temperature of 16.4 °C.

Corsica is one of the most wooded islands in the Mediterranean and has a high diversity of environments, from the littoral zones to the mountain summits (Reille, 1992). The lowest elevations are characterized by the predominance of sclerophyllous evergreen oak forest (*Quercus ilex*, *Q. suber*) and Mediterranean scrubland (*Erica arborea*, *Pistacia lentiscus*, *Cistus monspeliensis* and *Juniperus phoenicea*). At intermediate elevations, mesophyllous pine forest (*Pinus pinaster*) is widespread, and mixed deciduous forest (*Quercus pubescens*, *Q. petraea*, *Ostrya carpinifolia*, *Alnus cordata*, *Castanea sativa*) is locally abundant. At the local scale, l'étang de Piantarella is surrounded by Mediterranean maquis (*C. monspeliensis*, *J. phoenicea*, *P. lentiscus*, *Olea europaea*, *Arbutus unedo*) and marshland.

Sediment description

Bio-sedimentary units were defined based on granulometry, LOI and molluscs analysis:

Piantarella 1 (pollen analysis was done on 20 samples from the basal part of the core, 515-610 cm):

Unit I (620-515 cm; 7.4-7.2 kyr cal BP): gray clays rich in organic matter, abundant *Posidonia oceanica* and large specimens of lagoonal *Cerastoderma glaucum*. **Unit II** (515-300 cm; 7.2-5.8 kyr cal BP): medium to coarse gray sands containing layers of *P. oceanica* and shallow marine to lagoonal bivalve species such as *C. glaucum* and *Loripes lacteus*. **Unit III** (300-170 cm; 5.8-3.4 kyr cal BP): coarse sands containing shallow marine molluscs (*L. lacteus*, *Cerithium* sp., *Bittium reticulatum* and *C. glaucum*) alternating with layers of *P. oceanica*. **Unit IV** (170-100 cm; 3.4-1.7 kyr cal BP): alternating coarse gray sand layers with the remains of *P. oceanica*. No shells recognized. **Unit V** (100-0 cm; 1.7 kyr cal BP- present): greyish white silty clays with a low organic matter content (modern coastal swamplands).

Piantarella 2 (pollen analysis was done on 9 samples from core sections 5-69 cm, and 130-145 cm):

Unit I (315-300 cm): clayey sediments containing the abundant remains of *P. oceanica*. No shells. **Unit II** (300-160 cm): gray to greyish white fine to medium sands with a generally low organic matter content (<5%). Layers of *P. oceanica* are intercalated and abundant molluscs are representative of shallow marine to lagoonal species such as *L. lacteus*, *C. glaucum* and *Cerithium* sp.). **Unit III** (160-115 cm; 4.7-3.9 kyr cal BP): alternating medium to coarse sandy layers with intercalated gray clay layers containing the remains of *P. oceanica* and small intact shells, mainly *Cerithium* sp. **Unit IV** (115-90 cm; 3.9-1.8 kyr cal BP): medium to coarse gray sands with the intact gastropods *B. reticulatum* and *Cerithium* sp. **Unit V** (90-0 cm; 1.8 kyr cal BP to present): gray clayey layers alternating with fine sandy laminae and layers of *P. oceanica*. Molluscs are not abundant, but intact specimens such as *Cerithium* sp.

Piantarella 3 (pollen analysis was done on 28 samples from the basal part of the core, 250-381cm):

Unit I (420-400 cm; >6.7 kyr cal BP): coarse gray sands containing intact specimens of *B. reticulatum*. **Unit II** (400-250 cm; 6.7-5.3 kyr cal BP): black organic clays with numerous plant remains, wood fragments and specimens of *C. glaucum*. **Unit III** (250-50 cm; 5.3-1.2 kyr cal BP): medium to coarse gray

sands containing numerous layers of *P. oceanica*, intact marine gastropods (*Rissoa ventricosa*, *Nassarius reticulatus* and *B. reticulatum*).

Dating

Age-depth models for the 3 cores were based on twelve Accelerator Mass Spectrometry (AMS) radiocarbon dates (Table I). Calibration to years cal BP was made using Clam 2.2. (Blaauw, 2010) based on the data set Marine13.14C (Reimer et al., 2013), applying a regional ΔR correction of 27 ± 32 (averaged values for this sector of the Mediterranean Sea, Reimer and McCormac, 2002):

Piantarella 1					Piantarella 2				
Depth	Material	Date BP	Cal yr BP	diagram	Depth	Material	Date BP	Cal yr BP	diagram
79 cm	<i>P. oceanica</i>	1230±40	850-663	1225	179 cm	<i>C. vulgatum</i>	4520±40	4808-4562	4689
191 cm	<i>P. oceanica</i>	4230±30	4402-4190	3894	238 cm	<i>C. glaucum</i>	4520±35	4803-4570	4693
513 cm	<i>P. oceanica</i>	6660±30	7248-7074	7192	Piantarella 3				
625 cm	<i>C. vulgatum</i>	6930±50	7509-7307	7435	266 cm	<i>C. glaucum</i>	5195±35	5594-5453	5515
Piantarella 2					290 cm	<i>C. glaucum</i>	5550±40	6002-5777	5806
72 cm	<i>P. oceanica</i>	740±30	431-285	357	360 cm	<i>C. glaucum</i>	5950±40	6426-6261	6442
124 cm	<i>C. vulgatum</i>	4490±30	4779-4537	4655	388 cm	<i>C. glaucum</i>	6260±60	6838-6526	6673

Table I. 14C results for Piantarella 1, 2, 3.

Interpretation

Pollen Sum includes all pollen taxa except those of Cyperaceae, *Typha latifolia*, *Typha/Sparganium*, Amaranthaceae and other aquatic taxa in order to avoid over-representation by local taxa. Six pollen zones were defined, two for each core (Fig.1):

- **Piantarella 1-A** (7.4-7.3 kyr cal BP): Low values of AP (10-25%), dominated by *Pinus*. Highest values of *Erica* and continuous curve of Cistaceae, increasing trend of Poaceae and Amaranthaceae and high values of Asteraceae liguliflorae. Cerealia-t continuously present at the end of the zone.
- **Piantarella 1-B** (7.3-7.2 kyr cal BP): Decrease in *Erica* and expansion of herbs (A. liguliflorae, A. tubuliflorae, Poaceae). Decreasing trend in Amaranthaceae and almost continuous curve of Cerealia-t.
- **Piantarella 3- A** (6.6-6.4 kyr cal BP): low values of AP, showing increasing trend, similar representation of *Quercus ilex-coccifera* and *Q. deciduous* and increasing trend of *Olea*. High values of A. liguliflorae, A. tubuliflorae, *Cirsium*-t and low values of Amaranthaceae. Occurrence of Cerealia-t.
- **Piantarella 3- B** (5.9-5.3 kyr cal BP): decrease in AP (*Q. deciduous*, *Corylus*, *Olea*) and increases in *Erica* and Cistaceae, especially at the end of the zone (peak of *Erica* and Cistaceae at 5.3 kyr cal BP). Increase in AP values due to *Olea* expansion in ca. 5.5 kyr cal BP. Continuous representation of Cerealia-t at 5.6-5.4 kyr cal BP.
- **Piantarella 2- A** (4.7-4.6 kyr cal BP): high values of AP (29-48%) dominated by *Q. ilex-coccifera* and *Pinus*. Landscape dominated by *Erica* and Cistaceae and high representation of Amaranthaceae.
- **Piantarella 2- B** (0.4 kyr cal BP- present): decreases in AP and *Q. ilex-coccifera*, high values of Amaranthaceae, peaks in Poaceae and A. liguliflorae at 0.25 kyr cal BP, peak in *Erica* at the top.

Erica was dominant in the landscape from ~7.4 kyr cal BP to the present (maximum of 64% at ~7.4 kyr cal BP), with phases of regression during 7.3-7.2 kyr cal BP in Piantarella 1, and during 6.6-6.4 kyr cal BP in Piantarella 3. The original *Erica arborea* forest would have been progressively affected by human impacts, resulting in its conversion into Mediterranean scrubland. Thus, maquis vegetation dominated by *Erica* would have existed since the mid-Holocene in southern Corsica as a result of human impacts since the early Neolithic (earliest evidence of cereal cultivation at 7.35 kyr cal BP).

Acknowledgements

JR is member of the research group GAPS (2017 SGR 836) and acknowledges postdoctoral fellowship support from the Spanish “Juan de la Cierva (FJC2017)” program (MICINN, Spain). This research was undertaken through the PCR project “Approche géoarchéologique des paysages de Corse à l’Holocène, entre mer et intérieur des terres «Trà Mare è Monti», funded by Ministère de la Culture (France).

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