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CONTRIBUTIONS TO THE EUROPEAN POLLEN DATABASE

36. Praillos de Boissier mire, Tejeda Natural Park (Baetic Range, southern Spain)

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Site details

The Praillos de Boissier mire (36° 54′ 18.54″ N, 4° 04′ 19.39″ W), known locally as micro-*borreguil*, is located at 1610 m above sea level (a.s.l.) in the Tejeda Natural Park (Baetic range, Málaga province, southern Spain). Its name is dedicated to the eminent botanist Pierre Edmond Boissier, who collected plants in these mountains in 1837 (González-Bueno 2010). The small mire occupies 0.2 ha within a xerophilous shrubland of *Genista longipes* Pau ssp. *viciosoi* Talavera et Cabezudo, *Vella spinosa* Boiss., *Astragalus granatensis* Lam., *Anthyllis tejedensis* Boiss. and *Thymus longiflorus* Boiss. (Pérez-Latorre et al. 2004). The mire vegetation is mainly composed of *Sesleria argentea* (Savi) Savi, *Carex lepidocarpa* Tausch., *Carex flacca* Schreb., *Festuca iberica* (Hack.) K.Richt. and *Pinguicula dertosensis* (Cañig.) Mateo et M.B.Crespo (Pérez-Latorre et al. 2015). In this part of the Baetic range, slopes up to 900 m a.s.l. are covered by evergreen oak forests with *Quercus ilex* L., *Buxus balearica* Lam. and *Pistacia lentiscus* L., and with *Pinus halepensis* Mill., *Pinus pinaster* Ait. and *Pinus pinea* L. in drier situations. Above, they are replaced by mixed forests of *Quercus pyrenaica* Willd. and *Acer opalus* Mill. ssp. *granatense* (Boiss.) Font Quer et Rothm. The uppermost areas (1700–2068 m a.s.l.) are occupied by communities of *Juniperus communis* L. ssp. *hemisphaerica* (C.Presl.) Nyman, *Juniperus sabina* L., *Rhamnus saxatilis* Jacq. and *Prunus prostrata* Labill. Riparian forests are characterised by *Salix atrocinerea* Brot. and *Salix pedicellata* Desf. The climate is mediterranean with cold, wet winters and dry summers. Mean annual temperature is 15.7 °C and mean annual precipitation reaches 950–1000 mm. The mountain is built up of dolomitic marbles, red marly limestones, quartzites, schists and gneisses.

Sediment description

A 49 cm core was collected in 2013 using a 5 cm diameter Russian corer. The composition was as follows:

0–15 cm: light brown peat
15–49 cm: dark brown decomposed peat rich in mineral matter

Dating

Accelerator mass spectrometry (AMS) carbon-14 dating was performed on bulk peat samples by the Poznań Radiocarbon Laboratory (Poznań, Poland). Results are:
25 cm: Poz-68677, 1015 ± 30 BP (980–800 cal BP)
42 cm: Poz-68676, 1905 ± 30 BP (1925–1740 cal BP)
45 cm: Poz-64991, 3245 ± 35 BP (3560–3395 cal BP)

Interpretation

The core was sampled at 2-cm-intervals. More than 500 terrestrial pollen grains were identified in each sample. The pollen sum (100%) includes all pollen grains except those of Cyperaceae, spores of ferns and non-pollen palynomorphs (NPP). Four local pollen assemblage zones (LPAZ) were defined using CONISS in the TGVIEW® (© Eric C. Grimm) software package (Figure 1):

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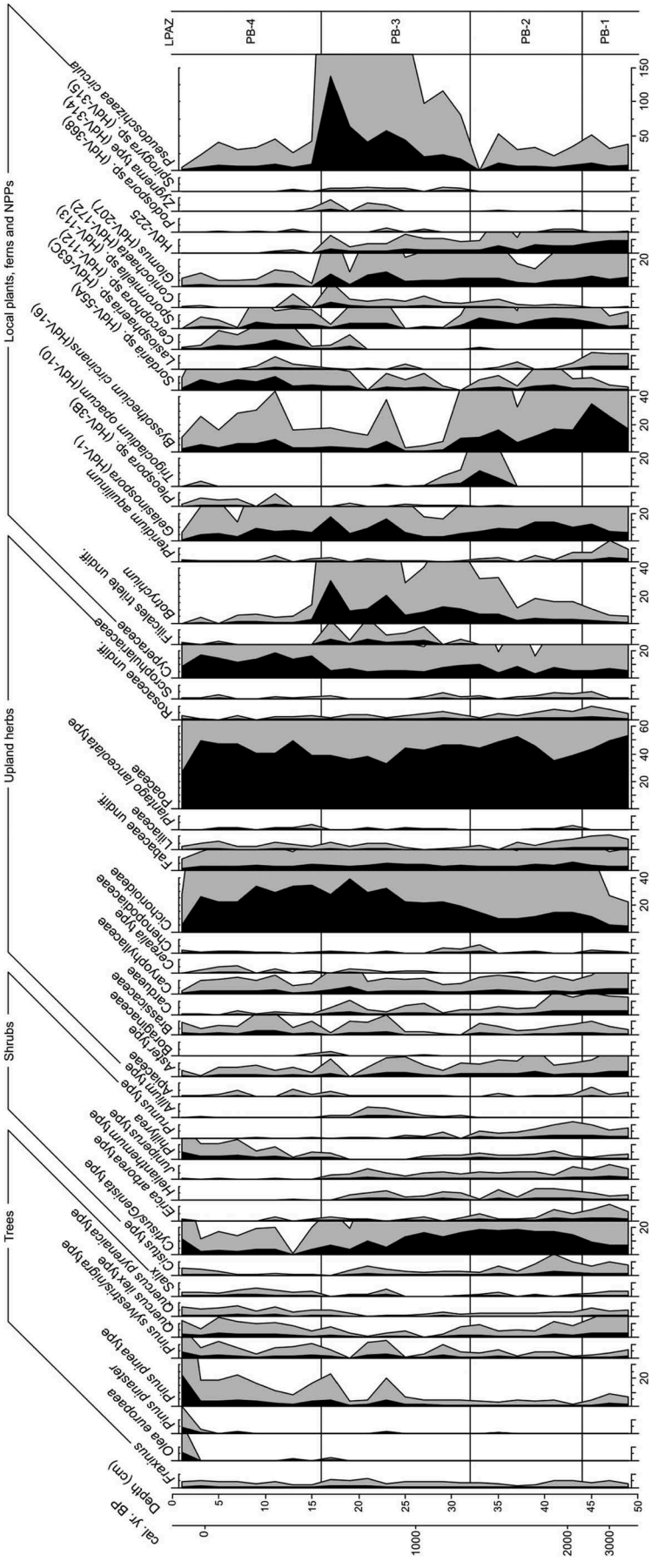

Figure 1. Pollen and non-pollen palynomorphs (NPP) diagram from the Praillos de Boissier mire, Tejeda Natural Park, Baetic Range, southern Spain (exaggeration factor: 5).

PB-1 (49–44 cm; c. 3470–2315 cal BP)

The landscape is dominated by shrub and herb communities composed of *Cytisus/Genista*-type, *Erica arborea*-type, *Juniperus*-type and Poaceae. There is little arboreal pollen, with low values of *Fraxinus, Pinus sylvestris/Pinus nigra*-type, *Pinus pinea*-type, *Quercus ilex*-type, *Quercus pyrenaica*-type and *Salix*. Although it has been suggested that the potential modern vegetation of this territory corresponds to high-mountain pine forests of *Pinus nigra* Arnold. ssp. *salzmannii* (Dunal) Franco (Pérez-Latorre et al. 2004), the present pollen data do not support this hypothesis, since such low percentages of *Pinus sylvestris/Pinus nigra*-type pollen (2–7%) reflect long-distance transport in a time during which no prehistoric settlements are known. *Gelasinospora, Byssothecium circinans* Fuckel, *Lasiosphaeria* sp. and HdV-225 show high values, suggesting mesotrophic to oligotrophic local dry conditions in the mire (Van Geel et al. 1989; Van Geel & Aptroot 2006).

PB-2 (44–32 cm; c. 2315–1315 cal BP)

Arboreal taxa are present with lower percentages compared to PB-1. Pollen of cultivated plants appears sporadically (*Cerealia*-type, 0.2%). Increasing values of *Cistus*-type, *Cytisus/Genista*-type, Poaceae and ruderal plants (*Aster*-type, Cichorioideae) suggest clearance of forests and the spread of arable lowland areas. High values of *Gelasinospora, Byssothecium circinans*, HdV-225 and *Trichocladium opacum* (Corda) S.Hughes keep on suggesting dry conditions (Chambers et al. 2011). The presence of anthropozoogenous plants (Chenopodiaceae, *Plantago lanceolata*-type) and dung-related fungal spores (*Sordaria* sp., *Sporormiella* sp., *Coniochaeta* sp., *Podospora* sp.) points to local grazing.

PB-3 (32–16 cm; c. 1315–540 cal BP

The increase of *Pinus pinea*-type and *Pinus sylvestris/Pinus nigra*-type pollen indicates pine recovery on the Meso- and Supra-mediterranean belts. Local vegetation is similar to the previous pollen zone with a lower representation of *Cistus*-type, *Cytisus/Genista*-type and Poaceae, while some ruderal plants (Cardueae, Cichorioideae) increase significantly. *Cerealia*-type and coprophilous fungi (*Chaetomium* sp., *Sordaria* sp., *Sporormiella* sp. and *Coniochaeta* sp.) display higher values. All data mentioned earlier, as well as the cultivation of olive (*Olea europaea* L.) *c.* 600 cal BP, suggest a moderate increase of human impact. A decrease in Cyperaceae and increasing values of *Gelasinospora, Zygnema*-type and *Spirogyra* sp. indicates a lowering of the water level and mesotrophic to eutrophic conditions in the mire (Van Geel et al. 1989). The simultaneous increase of *Glomus* and *Pseudoschizaea circula* (Wolff) Christopher may be related to erosive processes caused by woodland clearances or animal trampling. This caused the input of minerals to the mire sediments, thus favouring a further development of *Botrychium lunaria* (L.) Sw. (Nieto et al. 1987), which reaches its maximum values in this pollen zone.

PB-4 (16–1 cm; c. 540 cal BP–present)

In the uppermost zone, high values of *Pinus* pollen (*Pinus pinaster, Pinus sylvestris/Pinu nigra*-type, *Pinus pinea*-type) can be attributed to recent afforestation measures. An increase in farming and tree cropping on lowlands is revealed by maximum values of *Cerealia*-type and *Olea europaea*. The increasing trend of several anthropozoogenous taxa (*Plantago lanceolata*-type) and maximum values of dung-related fungal spores (*Cercophora* sp., *Sordaria* sp. and *Sporormiella* sp.) suggest heavy local grazing. The increase of local elements (Cyperaceae) and the persistence of certain NPPs (*Gelasinospora, Pleospora* sp., *Byssothecium circinans*) during this pollen zone is probably also connected with a lowering of the water level.

Disclosure statement

No potential conflict of interest was reported by the authors.

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