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Vegetation and landscape from 14th to 17th century AD in Marseille city centre, reconstructed from insect and pollen assemblages

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ABSTRACT

Archaeological excavations performed at "Place du Général-de-Gaulle" in the centre of the city of Marseille provided sediment samples spanning the period 14th–17th century AD and enabled insect and pollen analyses to be made in order to reconstruct vegetation and landscape of the ancient city outskirts. Insect and pollen assemblages reveal that fauna and flora in the area were heavily transformed by agriculture and pastoralism. Stands of *Pinus halepensis* Mill. (Aleppo pine) and *Pinus sylvestris* L. (scots pine), deciduous *Quercus* groves and remnants of Mediterranean *Quercus* forest with *Quercus ilex* L. (holm oak) and *Phillyrea* (mock privet) dominated the landscape. A typical shruby Mediterranean vegetation ("garrigue") with Cistaceae (rockrose), Lamiaceae (*Sideritis*) and Scrophulariaceae occurred nearby. Both pollen and insect evidence suggest that *Olea europaea* L. (olive tree), *Ficus carica* L. (common fig) and cereals were cultivated. Nitrophilous plants along with dung beetles indicate that livestock was abundant. Herbaceous plant dependent Coleoptera show that a ruderal vegetation associated with wastelands was established, but hygrophilous plants occurred locally in more humid areas. A variety of darkling beetles is recorded, and indicates that ruins and old stone walls were available. High numbers of beetles associated with pieces of wood soaked with seawater agrees with the hypothesis of a shipyard located nearby, and both halophilous ground-beetles and plants (Chenopodiaceae) indicate that saltpans were probably established in the area, as suggested by archaeological and historical data. Comparison between insect and pollen records shows that (1) there is a broad agreement between both records, (2) phytophagous insects may confirm the local presence of plant taxa, (3) the presence of plants not indicated in the pollen record may be revealed by phytophagous insects only, (4) insect data may provide abundant and original information concerning past human activities and anthropogenic environment.

1. Introduction

In northern Europe, fossil insect analysis is now well established as a major tool among the many biological disciplines that contribute to reconstruct past environments in anthropogenic contexts from archaeological sites (Buckland and Coope, 1991; Elias, 1994). Elsewhere in Europe, archaeological palaeoentomology is still in infancy. In France, the study of fossil arthropods found during archaeological excavations remains an almost entirely unexplored field of research. However in recent years an increased interest for archaeoentomology was noticed in France, as suggested by the brief account published by Ponel and Yvinec (1997). Recent French studies deal with various periods, from the Neolithic (Ponel, 1997), to the Roman period and the beginning of the Christian era (Matterne and Yvinec, 1996; Andrieu-Ponel et al., 2000; Ponel et al., 2000), to the Middle-Ages (Duverger, 1994; Huchet, 1994; Bocquillon et al., 1995).

In spite of some important taphonomical problems (Kenward, 1974, 1975, 1976), palaeoentomological reconstruction of ancient environments in anthropogenic contexts is particularly useful when compared with pollen analysis, as insects are less easily subject to long distance passive transport by wind and water streaming. Moreover, the existence of many phytophagous and monophagous/oligophagous beetle taxa associated with particular plant taxa, species or genera, helps to depict past vegetation associated with ancient human settlements and provides hints for the local presence of many plants. Furthermore, many Coleoptera are stenotopic species with narrow ecological requirements; their

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occurrence in insect assemblages may suggest that very specialized habitats were available nearby. Therefore, analyses comparing insect and plant macrofossil data (Moffet and Smith, 1996; Ponel et al., 2000), or insects and pollen data (Andrieu-Ponel et al., 2000; Ponel et al., 2001) are especially valuable.

In this paper, we present an attempt to reconstruct local environment from fossil insect and pollen data obtained from an archaeological site dated to the period 14th–17th century AD and located today in the city centre of Marseille (Bouiron, 1994, 2001), as (1) past vegetation and landscape in this area at that time remain largely unknown due to lack of appropriate sediment deposits, (2) this is an opportunity to compare beetle and pollen records to highlight the potential role of archaeoentomology as alternative tool for palaeoenvironmental reconstruction in archaeological contexts.

2. Materials and methods

2.1. The site

The old city of Marseille was founded 26 centuries ago on the north bank of a "calanque" (deep narrow creek in Mediterranean regions), now the "Vieux-Port" (Fig. 1), and in spite of some eastward extensions during medieval times, remained confined within the same limits until 1666 AD. Built on three hills, the walled city was bordered by the sea to the south ("Vieux-Port" side) and to the north-west. Beyond the walls, three others hills are located to the N-E, the S-E and on the southern bank of the calanque. The valleys separating these three hills merge together into a small plain, now the "place du Général-de-Gaulle", our study area (N43°17′43″/E5°22′33″, alt. 4 m). Located just outside the main wall of the fortified city, this area remained in a state of dereliction until the 17th century, and was occupied by temporary facilities linked to the port activities (Fig. 2) (Bouiron, 1994, 2001). From 1667 onwards, the area has been submitted to drastic changes: the wall was destroyed, the surrounding ditch was filled and the "Royal Shipyard" was established.

2.2. Sampling

Earthworks associated with the construction of an underground car-park below "Place du Général-de-Gaulle" in the lower part of the main street of Marseille, La Canebière, enabled us to extract several sediment samples. Samples for insect analysis were taken from structures located in a small plain outside the former city walls and were dated from the 14th to the 17th century. They were obtained

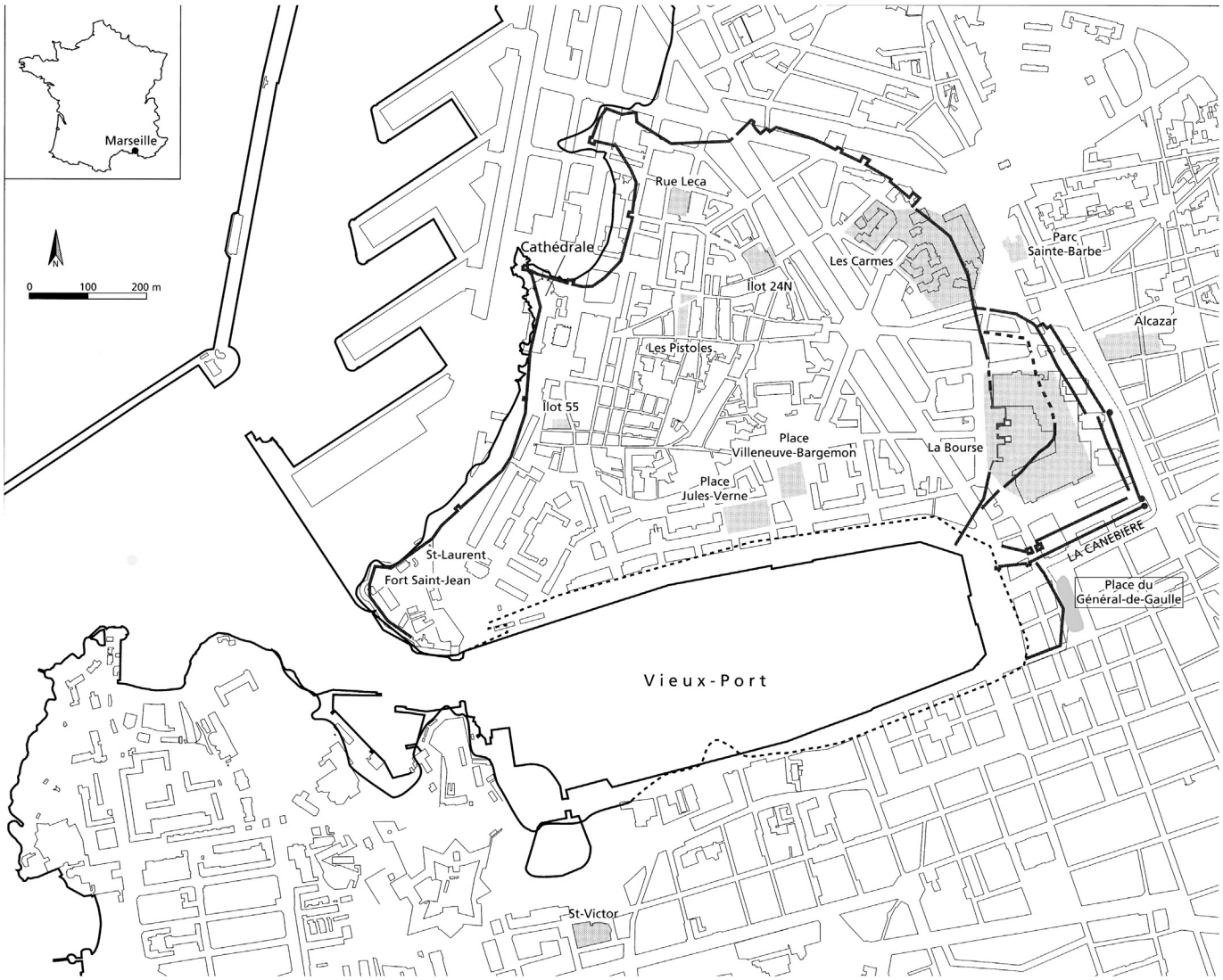

Fig. 1. Location of the "place du Général-de-Gaulle" excavation in the city of Marseille. The position of Hellenistic walls and their successive expansion during the Mediaeval period is indicated.

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