Céramiques imprimées de Méditerranée occidentale (VI^e millénaire AEC) : données, approches et enjeux nouveaux / Western Mediterranean Impressed Wares (6th millennium BCE): New data, approaches and challenges
Actes de la séance de la Société préhistorique française de Nice (mars 2019)
Textes publiés sous la direction de Didier Binder et Claire Manen
Paris, Société préhistorique française, 2022
(Séances de la Société préhistorique française, 18), p. 147-175
www.prehistoire.org
ISSN : 2263-3847 – ISBN : 2-913745-89-X

Towards a reinterpretation of decorative *Impressa* styles and implications for establishing cultural affiliations at the beginning of the 6th millennium in the Western Mediterranean

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Résumé : L'analyse des styles décoratifs des céramiques constitue l'un des piliers de fondation des scénarios de diffusion de l'économie agropastorale en Méditerranée occidentale. Dans l'histoire de la recherche, les travaux fondateurs de Luigi Bernabò Brea ont, dès les années 1950, mis en exergue les décors imprimés comme signature de l'unité culturelle du premier Néolithique de Méditerranée. Durant les décennies suivantes, les styles décoratifs sont restés au cœur des recherches destinées à préciser les cadres chronoculturels du complexe *Impresso-Cardial* et à établir les liens de filiation entre les divers groupes régionaux de Méditerranée occidentale. Mais au fur et à mesure que se sont enrichis les corpus archéologiques, le polymorphisme des styles décoratifs des communautés du VI^e millénaire n'a fait que croître, brouillant parfois la lecture des parentés culturelles. Dans ce contexte, les problèmes méthodologiques de formalisation des critères de description des systèmes du décor ainsi que leur quantification se posent tout particulièrement. Dans la continuité de travaux initiés précédemment, nous nous fondons sur l'analyse de différents sites répartis entre la péninsule italienne et le golfe du Lion au travers d'un protocole d'analyse renouvelé et partagé. Bénéficiant d'un cadre chronométrique affiné, nous montrons ainsi qu'il est possible de discriminer l'expression stylistique polymorphe des communautés *Impressa* et de proposer de nouvelles interprétations sur les parentés culturelles et donc sur les scénarios de néolithisation. Nous abordons enfin la question de la signification des systèmes décoratifs et notamment le manque de référentiel interprétatif.

Mots-clés : Méditerranée occidentale, néolithisation, *Impressa*, décoration céramique

Abstract: The analysis of decorative pottery styles is one of the pillars on which scenarios for the diffusion of the agropastoral economy in the Western Mediterranean are based. In the history of research, Luigi Bernabò Brea's pioneering work has, since the 1950s, highlighted impressed decorations as the signature of a cultural unity of the first Neolithic in the Mediterranean. Over the following decades, decorative styles remained a central research theme to clarify the chronocultural frameworks of the *Impressa-Cardial* complex and establish affiliations between the various regional groups in the Western Mediterranean. But the polymorphism of the decorative styles of communities in the sixth millennium has increased as archaeological corpuses have become richer. As a result, it is sometimes difficult to determine cultural affinities. In this context, the methodological problems of formalising the criteria for describing and quantifying decorative systems are particularly important. In continuity with previous works, this study is based on the analysis of different sites distributed between the italian peninsula and the Gulf of Lion using a renewed and shared analytical protocol. Using a refined chronometric framework, we show that it is possible to discriminate the polymorphic stylistic expression of *Impressa* communities and to propose new interpretations for cultural similarities and therefore for Neolithisation scenarios. Finally, we address the question of the meaning of decorative systems and in particular the lack of interpretative references.

Keywords: Western Mediterranean, neolithisation, *Impressa*, pottery decoration

INTRODUCTION

From a historiographic perspective, decorative pottery styles have been a privileged tool for the construction of historic-cultural frameworks for the Early Neolithic in the Western Mediterranean. We will rapidly recall the founding works of Luigi Bernabò Brea (Bernabò Brea, 1956) on the Mediterranean diffusion of the first Neolithic societies characterised by their impressed pottery, but also those of Pere Bosch-Gimpera (Bosch-Gimpera, 1965), highlighting the Mediterranean unity of the neolithisation phenomenon on the basis of specific pottery decorations. After that, from the 1970s onwards, decorative styles continued to be used to delimit smaller geocultural entities, sometimes to emphasise their cultural autonomy: first of all by distinguishing the Italo-Adriatic *Impressa* from the Franco-Iberian Cardial (Guilaine, 1976), then by reasserting the stylistic particularisms of pottery decoration on a regional scale and demonstrating the 'bush-like' nature of impressed pottery facies (Bernabeu Aubàn, 1989; Binder, 1995; Grifoni Cremonesi and Radi, 1999; Cipolloni Sampò *et al.*, 1999; Fugazzola Delpino *et al.*, 1999). In the middle of the 20th century, work was often only based on the observation of presence-absence of certain decorations – '*fossiles-directeurs* (markers)' – but later works progressively opted for a more systematic approach to decoration, sometimes with a tendency towards complex descriptive and difficult to reproduce typologies. One of the main achievements of the past decades is to have integrated the concept of the '*chaine opératoire*' in the analysis of the decorative system. At the same time, very varied statistical analyses have been carried out on data from the description of these decorative styles: comparison of presence-absence distribution, in counts or frequency (Binder, 1991; Radi, 2010), multivariate statistics (Manen, 2002; Bernabeu Aubàn *et al.*, 2017), or more recently, cladistic analyses (Pardo-Gordó *et al.*, 2019).

Today, it is now frequent to underline the polymorphism of the decorative pottery styles of the first Western Mediterranean farming communities; and the obstacles to the search of affiliations between communities raised by this polymorphism, and as a result the diffusion routes of the Neolithic economy. The purpose of this article, which is a continuity of a first work carried out by Giovanna Radi and colleagues as part of the meeting of the *Istituto Italiano di Preistoria e Protostoria* held in 2016 in Forlì, is to explore the relationships between the *Impressa* sites of Central and Southern Italy with those of the Northwestern Mediterranean. The aforementioned work led to the identification of certain methodological limits, including the problem of the disparate documentation of series or again, the difficulty in agreeing on a common descriptive vocabulary. With these considerations in mind, we continued this work based on new contextual data acquired as part of the ANR CIMO, with the following aims:

- to harmonise the descriptive vocabularies and to build up a comparable dataset for this vast distribution area in order to promote long-distance comparisons;
- to explore the perceived links between the different decorative pottery styles based on these quantified data;
- and to propose several hypotheses concerning the cultural affiliations between the South of Italy and the coast of Liguria and the Gulf of Lion.

MATERIAL AND METHODS

The selection of the corpus: the chronological argument

Before presenting the contexts and sites on which this discussion is based, it is essential to propose a rapid overview of the existing chronological framework. We do not intend to present here the exact chronological links between the sites and the pottery facies in relation to each other, but rather to specify the time scale of the initial *Impressa* implantations between the South of Italy and the Gulf of Lion. On the basis of the revised chronometric framework (Binder *et al.*, 2017; Binder, Gomart, *et al.*, this volume), it is now accepted that the initial *Impressa* productions in the Northwestern Mediterranean occurred between 5850 and 5600 cal. BCE, and that these early *Impressa* developments emerged with a slight chronological lag in relation to the south of the italic Peninsula and the Adriatic zone where the first agropastoral installations are identified from 5950 cal. BCE onwards. In this context, we considered that it was pertinent to focus on a period of 300 years, ranging between 5900 and 5600 BCE, a period during which *Impressa* communities settled in the South of Italy and spread towards Central Italy, on either side of the Apennines, and also as far as the Gulf of Lion.

The selection of the corpus: reliability and representativity of the contexts

In this perspective, we chose to only consider sites for which we have a revised chronometric framework at our disposal on one hand, and direct data on pottery decoration on the other. Although the corpus is limited in relation to the rest of the existing data, most of these sites (fig. 1) yield reliable contextual data, which is a crucial prerequisite for discussing stylistic affiliations. These single-phased or, conversely, stratified sites, also present the advantage of illustrating a great deal of the *Impressa* decorative variability.

Methodological prerequisites

As previously stated, the pottery of the *Impressa* communities in Southern Italy and the Gulf of Lion presents polymorphic decorative styles and it is sometimes difficult to accurately decipher the geographic and

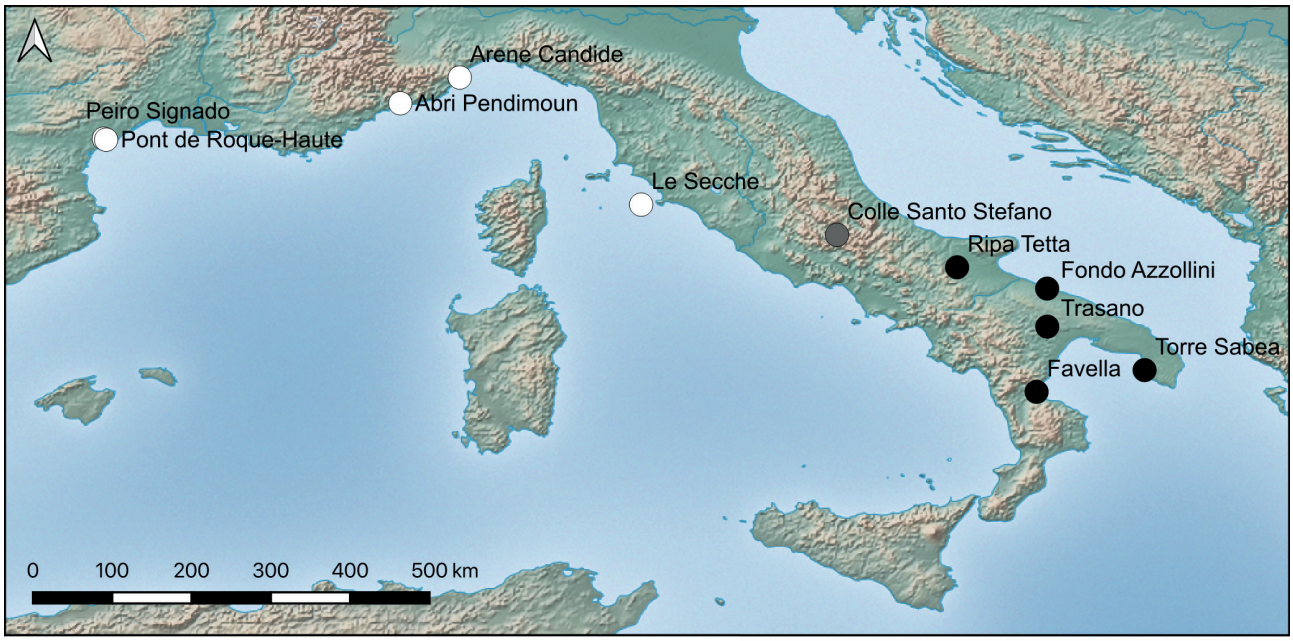


Fig. 1 – Location map of the selected sites. Southern Italy: Favella (Sibari, Calabria); Torre Sabea (Gallipoli, Apulia); Trasano (Matera, Basilicata); Fondo Azzollini (Pulo di Molfetta, Apulia); Ripatetta (Lucera, Apulia). Central Italy: Colle Santo Stefano (Ortucchio, Abruzzo). North-Western Mediterranean: Le Secche (Giglio, Toscana); Arene Candide (Finale Ligure, Liguria); Pendimoun (Castellar, Alpes-Maritimes); Peiro Signado (Portiragnes, Hérault); Pont de Roque-Haute (Portiragnes, Hérault).

***Fig. 1 –** Carte de répartition des sites retenus. Italie du Sud : Favella (Sibari, Calabre) ; Torre Sabea (Gallipoli, Pouilles) ; Trasano (Matera, Basilicate) ; Fondo Azzollini (Pulo di Molfetta, Pouilles) ; Ripatetta (Lucera, Pouilles). Italie centrale : Colle Santo Stefano (Ortucchio, Abruzzes). Nord-Ouest méditerranéen : Le Secche (Giglio, Toscane) ; Arene Candide (Finale Ligure, Ligurie) ; Pendimoun (Castellar, Alpes-Maritimes) ; Peiro Signado (Portiragnes, Hérault) ; Pont de Roque-Haute (Portiragnes, Hérault).*

chronological growth dynamics of the first agropastoral societies. This significant polymorphism overlaps with the use of descriptive terminologies that are rarely harmonised between researchers and the different regions, which further complicates widescale comparatist perspectives. Work on the harmonisation and the structuration of the dataset is thus a crucial methodological prerequisite. In this first wide-scale work, we thus chose to focus on several collectively used criteria which could be exploited for quantitative analysis. This quantification aspect also represente an important prerequisite. Indeed, as all of these productions share a common basis, the interpretation of temporal and geographic variability only appears to be significant when series are taken into consideration, using frequency data. As it was not possible to dispose of a minimum number of vases for all the assemblages considered here, this work is based on counts of numbers of remains.

The descriptive criteria used are presented below. They stem from the pooling of protocols which were, up until now, established independently of each other (Natali, 2010; Binder *et al.*, 2010; Angeli, 2012). In this way, we focus on:

– the proportion of decorated/non-decorated vessels;
– the general structure of the decoration;
– and the specific decorative process on which the quantified comparative analysis is based.

The description method for the general structure of decoration (fig. 2) is based on proposals published in Binder *et al.*, 2010. It describes the way the potter organised his/her decoration in the decorated zone(s) and the type and general orientation of the axes of symmetry. The decorative process combines information on the state of the clay (wet/leather-hard or dry), the technique, the gesture and the 'matrix' used (fig. 3).

RESULTS

Before presenting an overall image of the characters of the decorative styles in our study zone, it seemed pertinent to recall the main characteristics of these styles according to their geocultural entities in order to provide a detailed overview of the structuration of the data subsequently employed on a wider scale. In order to do so, we defined three main regions.

The decorative *Impressa* styles of the Apulia-Basilicata-Calabria region

The South and Italian Adriatic is traditionally considered as the original source of the main technical and economic components of the *Impressa* complex. On the basis of the restrictive criteria outlined above, we retained eight sites in this region, located in Calabria, Apulia and Basilicata (fig. 1).

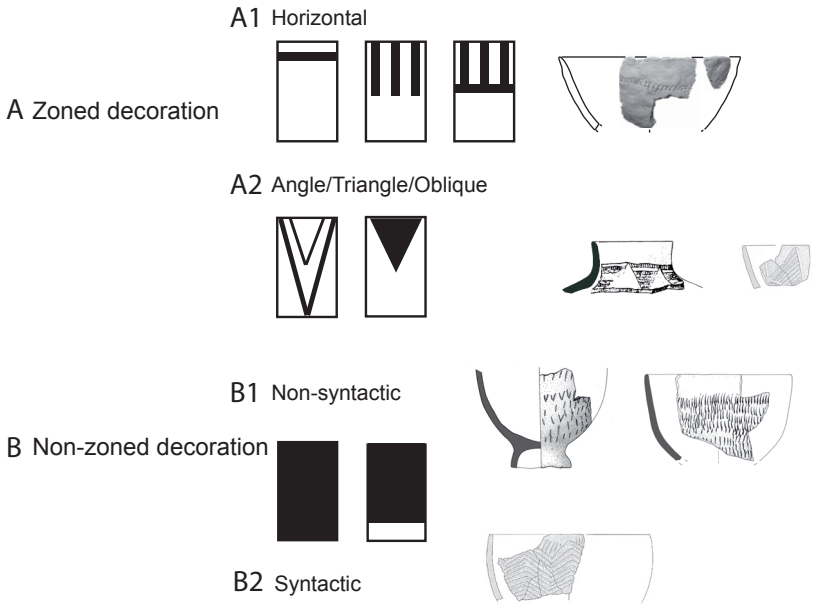


Fig. 2 – Methodology used for the description of the general structure of decoration. After Binder *et al.*, 2010.
Fig. 2 – *Principes de description de la structure générale du décor. D'après Binder* et al.*, 2010.*

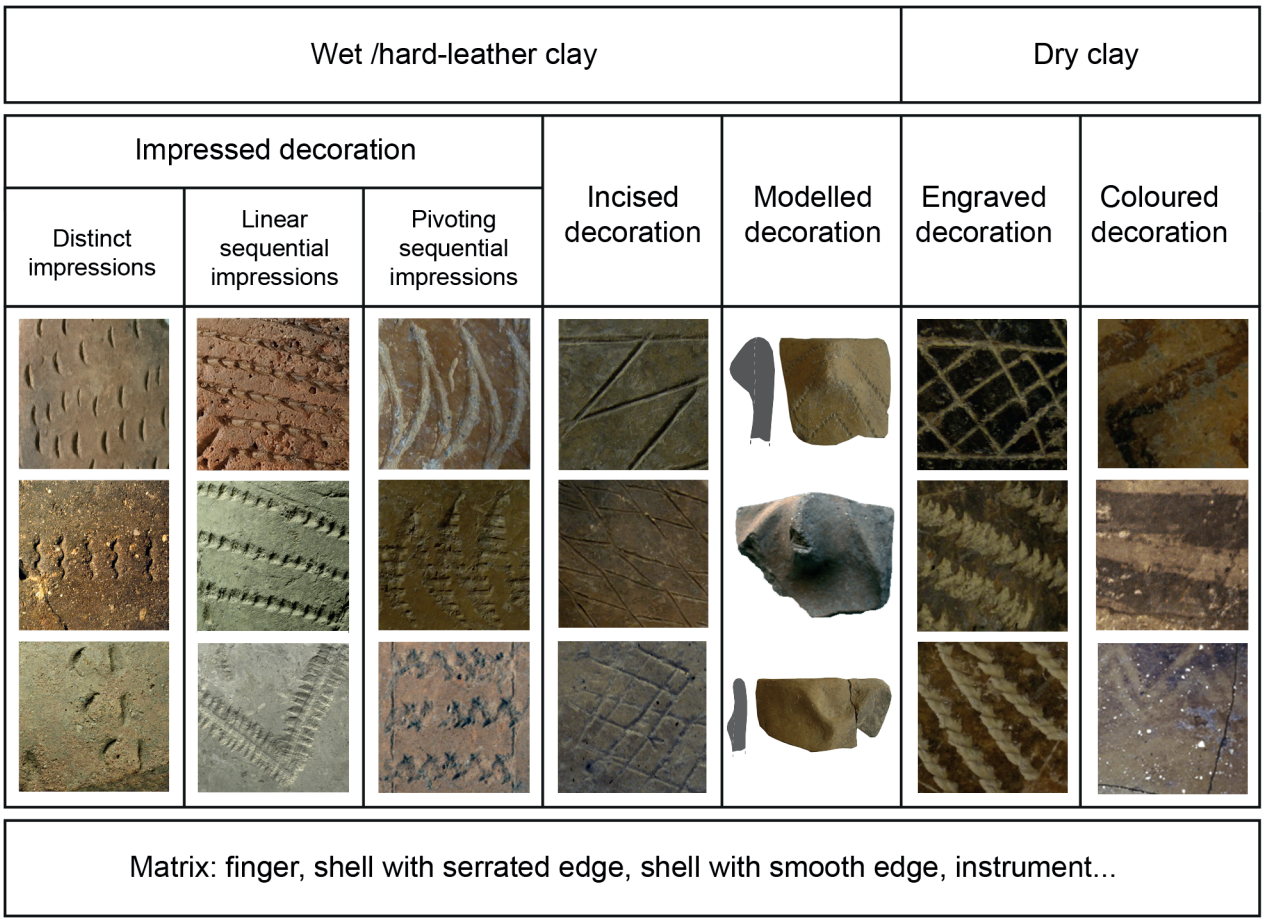


Fig. 3 – Method used for the description of the decorative processes.
Fig. 3 – *Principes de description des procédés décoratifs.*

The open-air site of Favella (Sibari, Calabria), excavated by Vicenzo Tinè (Tinè, 2009), is characterized by numerous pit structures containing an important pottery assemblage for the characterization of the first phase of *Ceramica Impressa* (6,236 fragments). Two classes of pottery are distinguished (Natali, 2009 and 2010): coarse (86%) generally decorated vessels (94%) and fine (14%), often non-decorated vessels (77%). The decorative elements are only made on wet clay (fig. 4 and SD-1), by the distinct impression of diverse matrices (99% of the decorated fragments) and very occasionally, by incision (1%). Only three sherds present plastic decoration consisting of light undulating ribs associated with distinct impressions. Digital-nail impressions form the vast majority of decorations on large vessels in the coarse category (46% of the impressed decoration). Impressions made with a tool with a rectilinear extremity (classified in the 'indeterminate tool' category) are also well represented (23%), as are patterns obtained with a shell with a serrated edge (15%). The structure of the decoration is covering, non-zoned, non-syntactic. On fine vessels, the majority of the decorations are distinct impressions made with shells

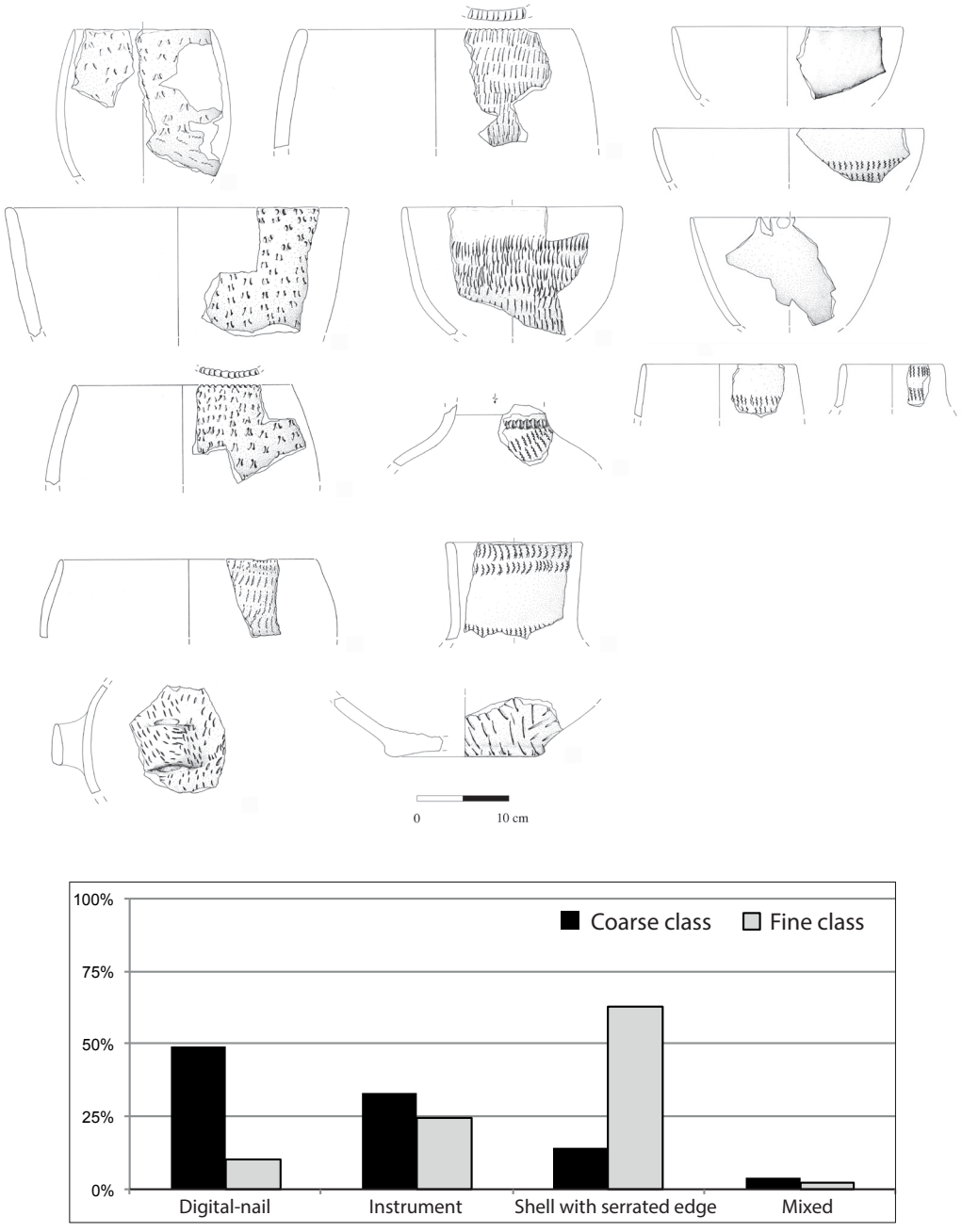


Fig. 4 – Main characteristics of ceramic decorative styles of the pottery of Favella (Sibari, Calabria). Simple impressions on wet clay (the quantitative data are available in the supplementary data). 1-11: coarse class; 12-21: fine class. After Natali, 2009 and 2010.
Fig. 4 – *Résumé des principales caractéristiques des styles décoratifs de la céramique de Favella (Sibari, Calabre). Impressions simples sur pâte humide (les données quantifiées sont disponibles dans les données supplémentaires). 1 - 11 : classe grossière ; 12 - 21 : classe fine. D'après Natali, 2009 et 2010.*

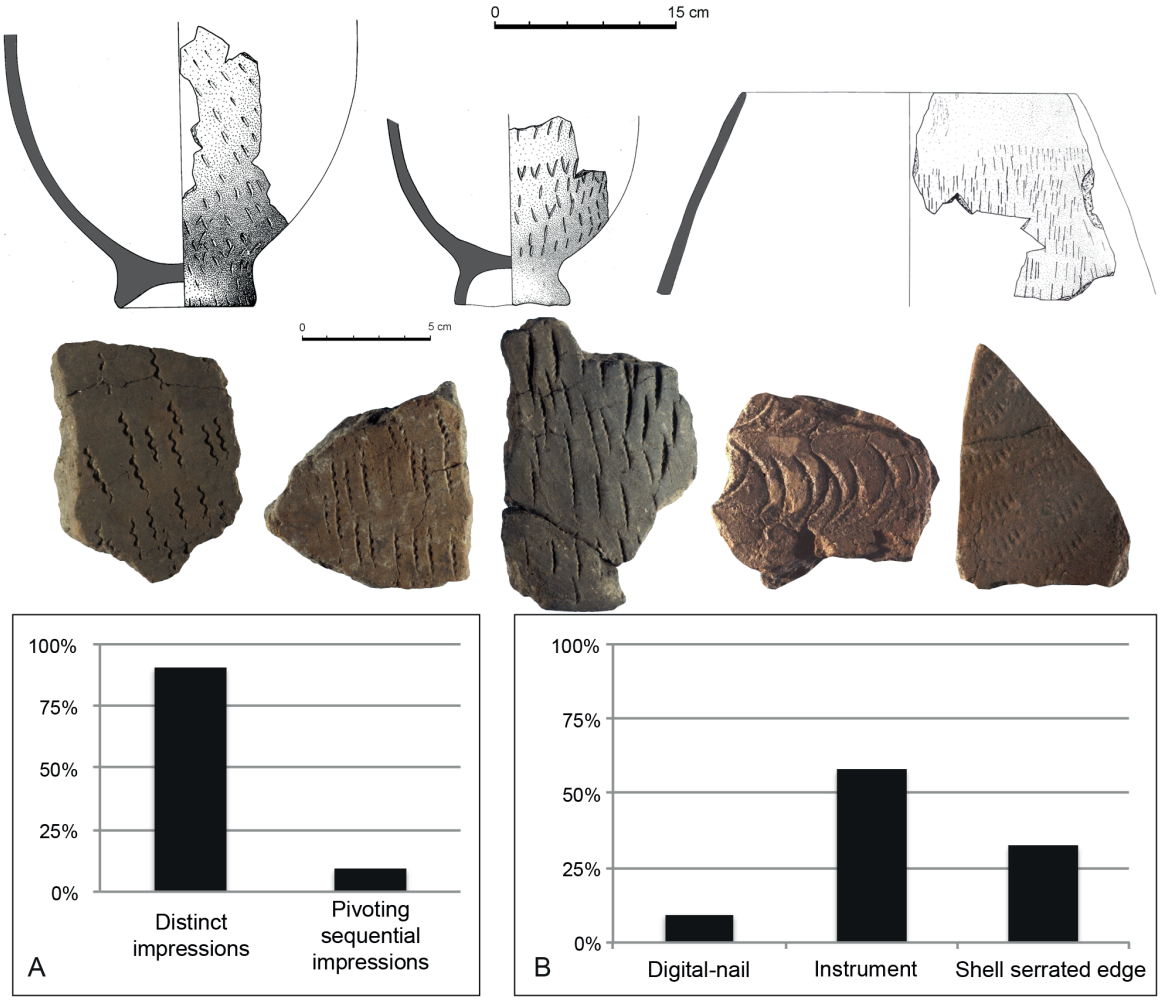


Fig. 5 – Main characteristics of ceramic decorative styles of the pottery of Torre Sabea (Gallipoli, Apulia). A: the different types of simple impressions on wet clay; B: the different types of tools used for the impressed decoration on wet clay (the quantitative data are available in the supplementary data). After Fontó and Radi, 2003.

Fig. 5 – *Résumé des principales caractéristiques des styles décoratifs de la céramique de Torre Sabea (Gallipoli, Pouilles). A : les différents types d'impressions sur pâte humide ; B : les différentes matrices utilisées pour les décors imprimés sur pâte humide (les données quantifiées sont disponibles dans les données supplémentaires). D'après Fontó et Radi, 2003.*

with serrated edges (60%). We also observe decoration obtained with a point (11%), a tool with a rectilinear extremity (14%) and digital-nail impressions (9%). For this category of fine vessels, the structure of the decoration is in this case more varied and careful: beside the non-zoned non-syntactic decoration, we often observe decoration with a horizontal zoned structure (empty band near the edge) and, very rarely, organised into triangles. Decorations made with a triangular, oval and tubular or curvilinear extremity – classified in the indeterminate tool category – are rare in both classes.

The stratified site of Torre Sabea (Gallipoli, Apulia), excavated by Jean Guilaine and Giuliano Cremonesi (Guilaine and Cremonesi, 2003), yielded pottery productions (Fontó and Radi, 2003) for which it is not possible to identify differentiated decorations according to the categories of vessels. The series is made up of 3,629 fragments, consisting of 69% decorated fragments and 31% non-decorated fragments. The decoration (fig. 5 and SD-2) is made on wet clay for 99% of these fragments, mostly by impression (94%), then by incision (5%). For the impressed decoration, distinct impressions are predominant (91%), followed by pivoting sequential impressions (9%). The distinct impressions are mainly made with indeterminate instruments (58%), and shells with serrated edges (33%). Digital-nail impressions are rare (9%). The overall structure of the decoration is covering, non-zoned and non-syntactic. In parallel, we observe a small quantity of pottery decorated on dry clay by pivoting sequential impressions (‘*microrocker’;* only 1% of the decorations). The characteristics of the clay, surface treatment and the fact that it is localised in the top part of the deposits suggests that they could be linked to a post-*Impressa* frequentation of the site.

At Fondo Azzollini (Pulo di Molfetta, Apulia), layer 3 (Muntoni, 2003) yielded a pottery corpus consisting of 216 fragments, including 82 decorated fragments. We observed (fig. 6 and SD-3) the predominance of impressed decorations on wet clay (93%) with no particular organisation on the vessel (non-zoned). These decorations are

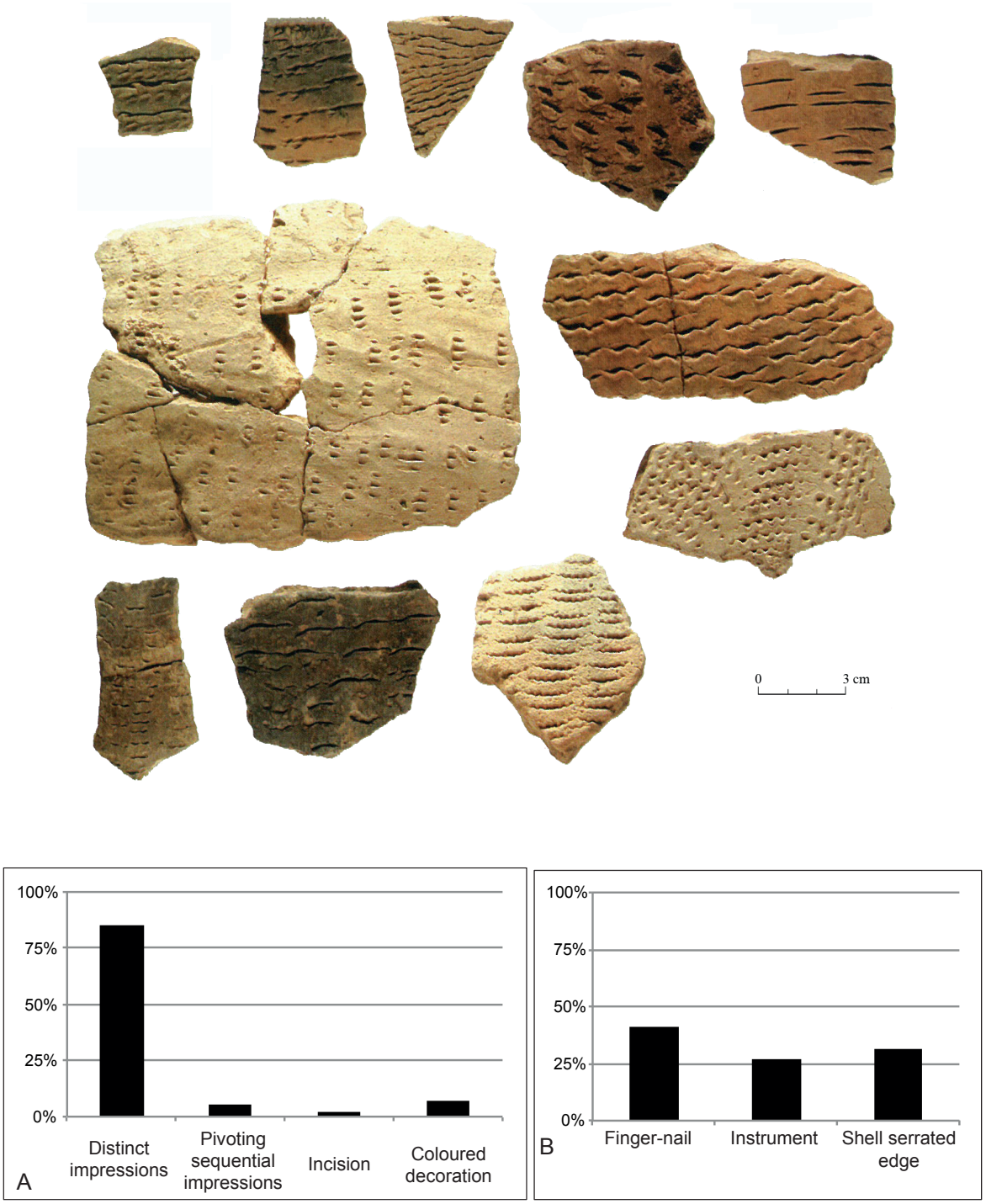


Fig. 6 – Main characteristics of ceramic decorative styles of the pottery of Fondo Azzollini (Pulo di Molfetta, Apulia). A: the different types of decorative processes; B: the different types of tools used for the impressed decoration on wet clay (the quantitative data are available in the supplementary data). After Muntoni, 2003.

Fig. 6 – *Résumé des principales caractéristiques des styles décoratifs de la céramique de Fondo Azzollini (Pulo di Molfetta, Pouilles). A : les différents procédés décoratifs ; B : les différentes matrices utilisées pour les décors imprimés sur pâte humide (les données quantifiées sont disponibles dans les données supplémentaires). D'après Muntoni, 2003.*

mainly made by distinct impressions (95%) with varied matrices: finger, shell with serrated edge and indeterminate instrument. We also observed several cases of sequential pivoting impressions (*rocker;* only 5% of decorations). In addition to impressions on wet clay, several fragments are decorated with incisions (2% of decorations) or by the application of coloured matter (paint on 7% of the decorated vessels).

The stratified site of Trasano (Matera, Basilicata), excavated by Jean Guilaine and Giuliano Cremonesi, yielded a long occupational sequence (Guilaine and Cremonesi, 1987; Cremonesi and Guilaine, 1996). The data presented here are partial and only concern the

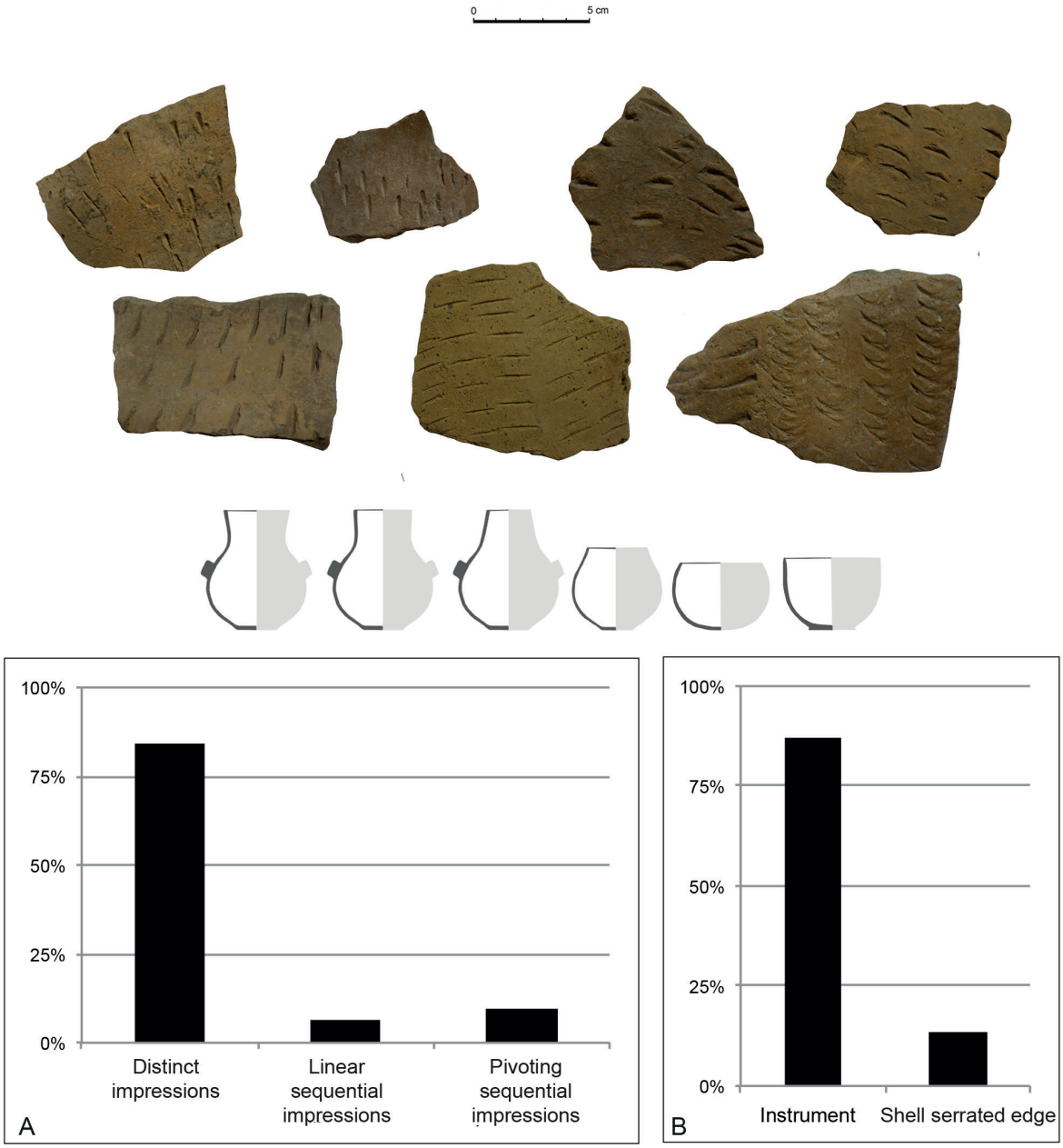


Fig. 7 – Main characteristics of ceramic decorative styles of the pottery of Trasano I (Matera, Basilicata). A: the different types of impression on wet clay; B: the different types of tools used for impressed decoration on wet clay (the quantitative data are available in the supplementary data). After Angeli, 2012.

Fig. 7 – *Résumé des principales caractéristiques des styles décoratifs de la céramique de Trasano I (Matera, Basilicate). A : les différents types d'impressions sur pâte humide ; B : les différentes matrices utilisées pour les décors imprimés sur pâte humide (les données quantifiées sont disponibles dans les données supplémentaires). D'après Angeli, 2012.*

sequence of the eastern sector B (Guilaine *et al.*, 2018 and 2019). In addition, in order to remain within the defined chronological range, only phases Trasano I and Trasano II will be presented. Trasano I yielded a corpus of 1,623 fragments, including 561 decorated fragments. Most of the decorations (fig. 7 and SD-4) are impressed on wet clay (99%) and very rarely engraved (fine line) on dry clay (1%). Among the impressions on wet clay, distinct impressions made with an indeterminate instrument are predominant (84%), followed by several sequential pivoting impressions '*rocker*' (10%) and sequential linear impressions '*sequenza*' (6%). The structure of the decoration is covering, non-syntactic and non-zoned.

Trasano II presents 3,980 fragments, of which about 27% are decorated. Most of the decorations (fig. 8 and SD-5) were made on wet clay (89%), but a significant portion of them (from the top of layer 2) were made on dry clay. On wet clay, impressed decorations are prevalent (81%) and are divided between distinct (69%) and sequential (31%) linear and pivoting impressions, which are increasingly used. Among the matrices used for the distinct impression decorations, indeterminate instruments are predominant, followed by shells with smooth

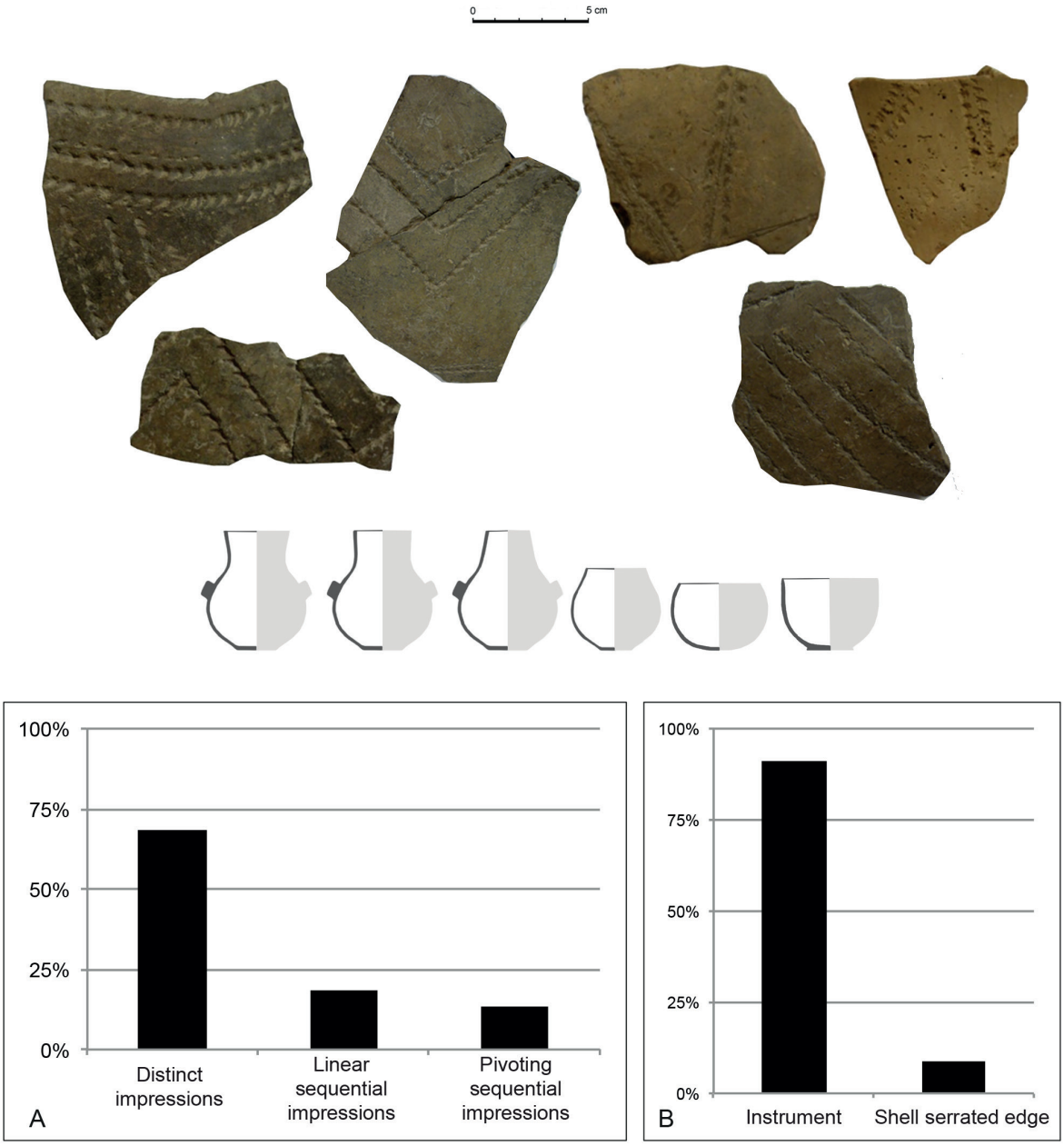


Fig. 8 – Main characteristics of ceramic decorative styles of the pottery of Trasano II (Matera, Basilicata). A: the different types of impression on wet clay; B: the different types of tools used for simple impressions on wet clay (the quantitative data are available in the supplementary data). After Guilaine *et al.*, 2019.

Fig. 8 – *Résumé des principales caractéristiques des styles décoratifs de la céramique de Trasano II (Matera, Basilicate). A : les différents types d'impressions sur pâte humide ; B : les différentes matrices utilisées pour les décors d'impressions distinctes sur pâte humide (les données quantifiées sont disponibles dans les données supplémentaires). D'après Guilaine* et al.*, 2019.*

or serrated edges. In the category of decorations on wet clay, we also note a small portion of incisions. Finally, on dry clay, we find fine line engravings and very occasionally paint. It is thus important to underline the very diversified nature of the decorative processes. From here onwards, the overall structure of the decoration is non-zoned (66%) and horizontally zoned (34%).

Ripatetta (Lucera, Apulia) excavated by Carlo Tozzi (Tozzi, 2001 and 2002; Colombo and Tozzi, 2017) was subdivided into different sectors. Only the data from zone A, where an *in situ* stratigraphy was conserved, are analysed here. Phase I (RTI) yielded a pottery assemblage of 3,292 fragments, including 2,253 decorated fragments. Decoration (fig. 9 and SD-6) on wet clay is predominant (97%) and consists mainly of impressions (94%) and very rarely of incisions (3%). Among the impressed decorations, distinct impressions are dominant (97%), made with a non-determined instrument (77%), a shell with a serrated edge (13%) or fingers (11%). Linear or pivoting sequential impressions are very rare (3% of the impressed decorations). On dry clay (3%), we observe coloured and engraved decorations (*microrocker* and *graffito largo*). The overall structure of the decoration is mainly non-zoned non-syntactic (97%). Zoned decorations are

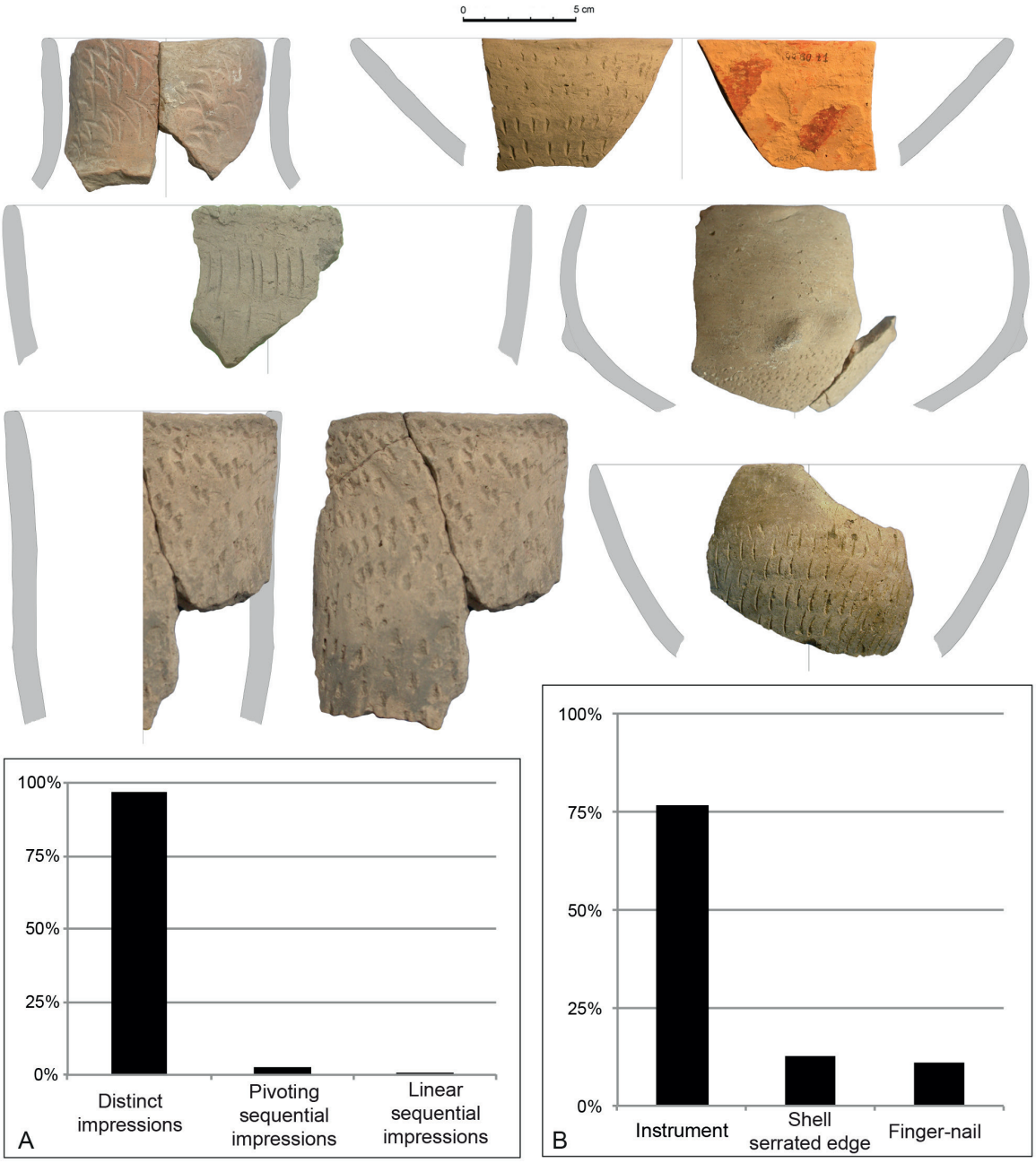


Fig. 9 – Main characteristics of ceramic decorative styles of the pottery of Ripatetta I (Lucera, Apulia). A: the different types of impression on wet clay; B: the different types of tools used for simple impressions on wet clay (the quantitative data are available in the supplementary data). After Colombo and Tozzi, 2017.

Fig. 9 – *Résumé des principales caractéristiques des styles décoratifs de la céramique de Ripatetta I (Lucera, Pouilles). A : les différents types d'impressions sur pâte humide ; B : les différentes matrices utilisées pour les décors d'impressions distinctes sur pâte humide (les données quantifiées sont disponibles dans les données supplémentaires). D'après Colombo et Tozzi, 2017.*

restricted to decorations on dry clay (*rocker*, addition of coloured material and *graffito*). Phase II (RTII) comprised 3,928 fragments, of which 2,314 are decorated. Decorations (fig. 10 and SD-7) on wet clay are predominant (89 %) but in decline in relation to the previous phase (impressions (86 %) decrease whereas incisions are constant). Distinct impressions are still predominant (89 %), made with a non-determined instrument (83 %), whereas the use of shells with serrated edges (9 %) and the finger (8 %) diminishes. Linear or pivoting sequential impressions increase (11 %). The same is true of decorations on dry clay (10 %), which take the form of painted decorations with red or brown bands.

In order to attain an overall vision of the decorative attributes of the pottery in this set of sites and to go beyond the simple, merely descriptive statistics mentioned above, we carried out a multivariate analysis (FCA). The contingency table required the simplification of the descriptive criteria due to problems related to the non-harmonisation of descriptive and quantitative methods. Only the decorative processes were considered: distinct digital-nail impression, distinct impression with an instrument, distinct

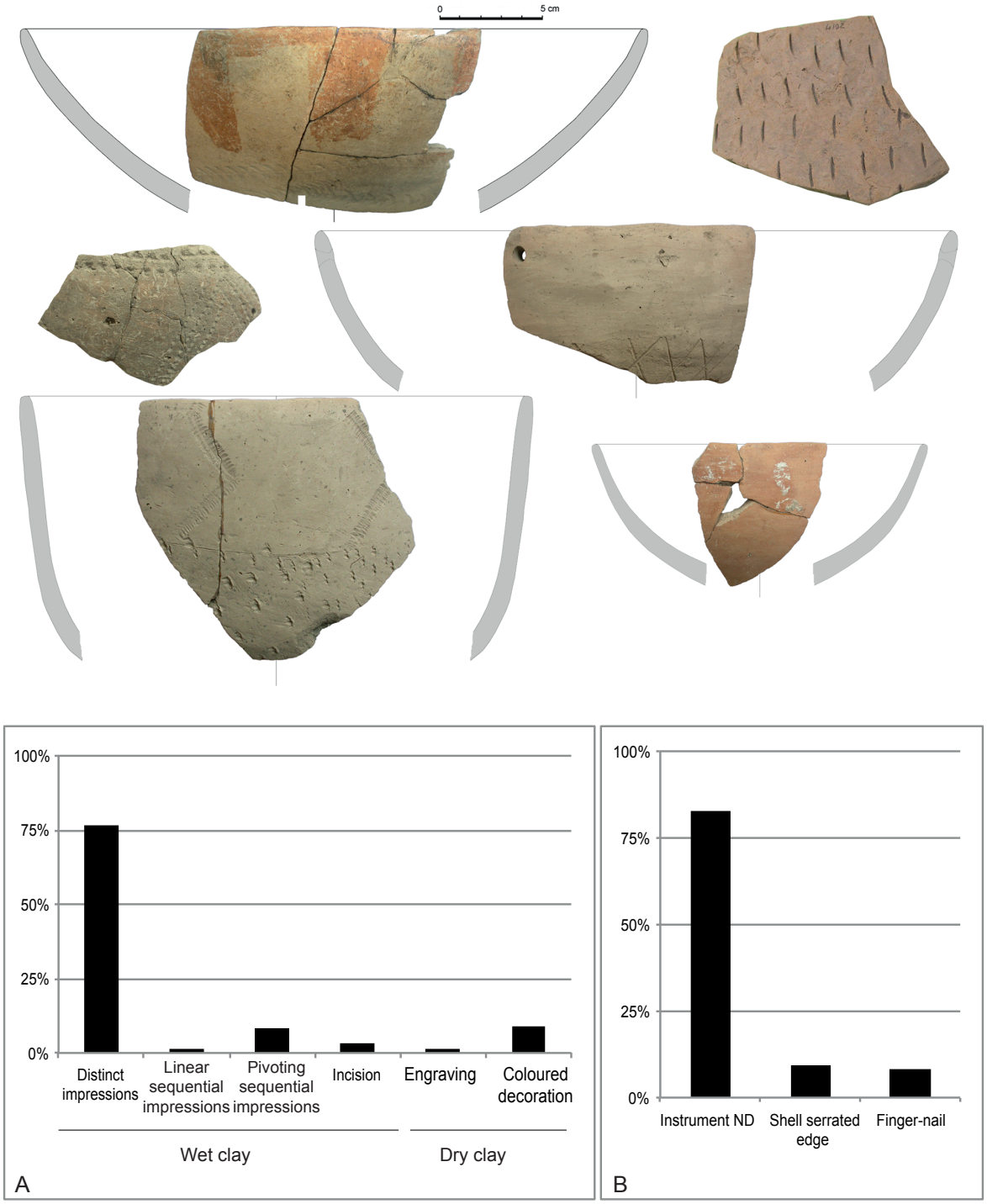


Fig. 10 – Main characteristics of ceramic decorative styles of the pottery of Ripatetta II (Lucera, Apulia). A: the different types of decorative processes on wet and dry clay; B: the different type of tools used for simple impressions on wet clay (the quantitative data are available in the supplementary data). After Colombo and Tozzi, 2017.

Fig. 10 – *Résumé des principales caractéristiques des styles décoratifs de la céramique de Ripatetta II (Lucera, Pouilles). A : les différents types de procédés décoratifs sur pâte humide et sèche ; B : les différentes matrices utilisées pour les décors d'impressions distinctes sur pâte humide (les données quantifiées sont disponibles dans les données supplémentaires). D'après Colombo et Tozzi, 2017.*

impression with a shell with a serrated edge, linear sequential impression with an instrument, pivoting sequential impression with a shell, pivoting sequential impression *microrocker* type, incision, modelling, engraving, application of coloured material. We first of all note (fig. 11 and SD-8) a good representation of the dataset on the first two factorial axes (83 % expressed variability). The first factor, F1, recruits 60 % variance and receives the contribution of distinct digital-nail impressions (41 %) and linear sequential impressions with an instrument (24 %). The second factor, F2, recruits 22 % inertia. The projection of specimens and variables on factorial designs 1 and 2

shows a double parabola organisation (Guttman effect), a priori characteristic of ordered series. The diverse sets are distributed according to their stratigraphic order which enables us to propose a chronological significance for the first factorial axis. The earliest assemblages (F-Favella and FA-Fondo Azzollini) are mainly characterized by distinct impressions on wet clay using fingers and shells. Torre Sabea (T), Trasano I (TI) and Ripatetta I (RTI) – which contribute more to axis 2 – form a second coherent set, structured around distinct impressions on wet clay using an indeterminate instrument. We note that in this chronological structuration, the position of Ripatetta I, attributed to the evolved *Impressa* phase (Guadone phase), on the basis of its decorative style, is coherent with data from the absolute chronology which are partly mixed up with the archaic *Impressa* phase (Binder *et al.*, 2017), represented here by Torre Sabea and Trasano I. The position of Ripatetta II is determined by the increase in painted decoration which is the distinctive element of the recent phase of local impressed pottery. Finally, Trasano II (TII) is very different from the two preceding assemblages, mainly due to decorations on wet clay consisting of linear sequential impressions made with an indeterminate instrument (*sequenza*) and decorations on dry clay (*graffito a linea fine*). In general, Ripatetta II and Trasano II indicate the emergence or the development of decorative forms which become markers of regional evolution: painted decoration in Northern Apulia and engraved decoration in Salento and Materane. This first attempt based solely on decorative processes should be backed up by taking into consideration the general structure of decoration on vessels. But it presents the advantage of objectifying data and setting several

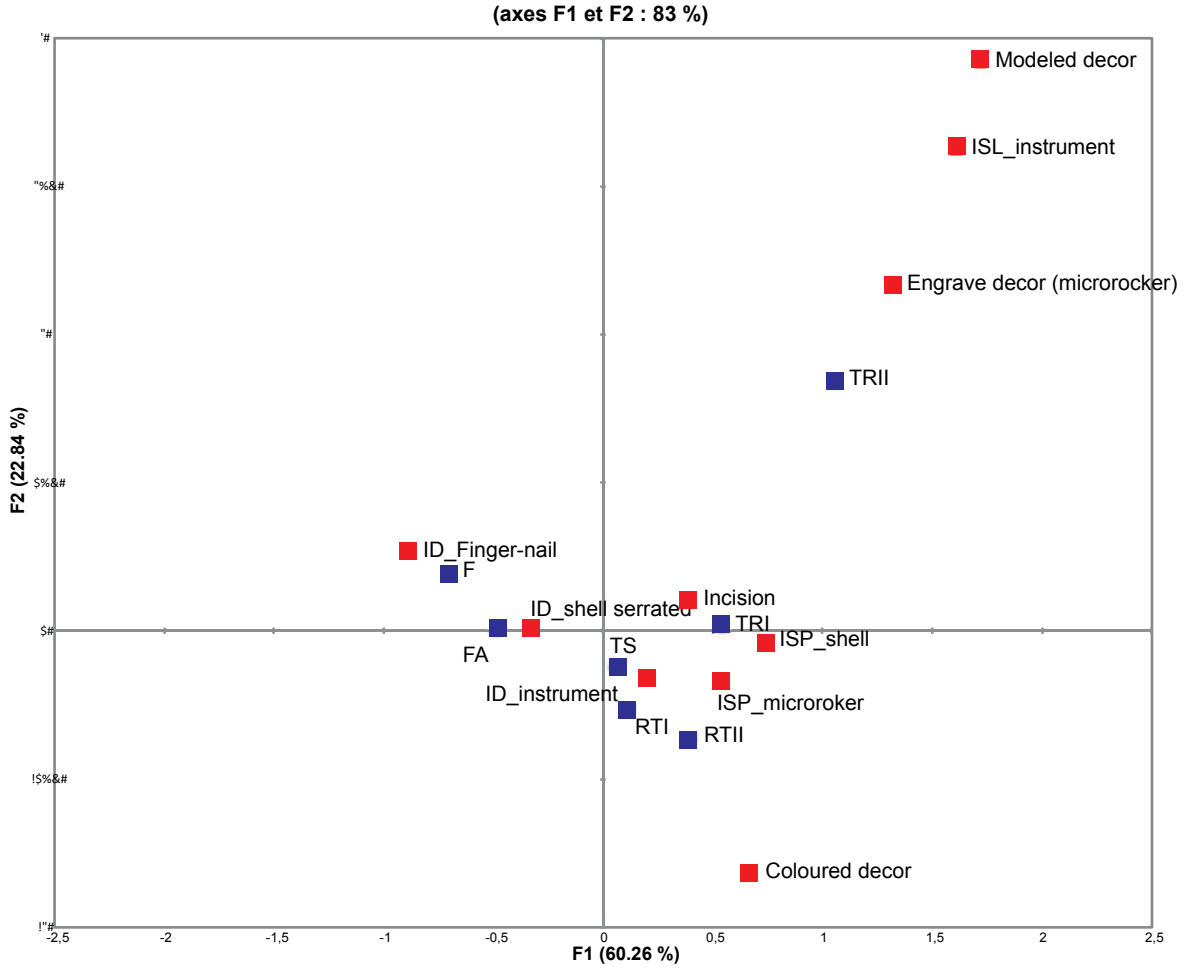


Fig. 11 – Correspondence analysis (CA) based on the counts (number of sherds) of the main ceramic decorative processes of the sites from Southern Italy. The projection of individuals and variables on factorial designs 1 and 2 is organized according to a double parabola (Guttman effect), characteristic of the ordered series a priori. The various sets are distributed in stratigraphic order thus making it possible to propose a chronological significance for the first factorial axis. ID: simple impression; ISL: linear sequential impression; ISP: pivoting sequential impression. The quantitative data are available in the supplementary data.

***Fig. 11** – Analyse factorielle des correspondances (AFC) fondée sur le décompte en nombre de restes des principaux procédés décoratifs des céramiques des gisements d'Italie du Sud. La projection des individus et des variables sur les plans factoriels 1 et 2 s'organise selon une double parabole (effet Guttman), caractéristique des séries ordonnées a priori. Les divers ensembles s'y distribuent en respectant l'ordre chronologique ou stratigraphique, permettant ainsi de proposer une signification chronologique au premier axe factoriel. ID : impression distincte ; ISL : impression séquentielles linéaire ; ISP : impression séquentielle pivotante. Les données quantifiées sont disponibles dans les données supplémentaires.*

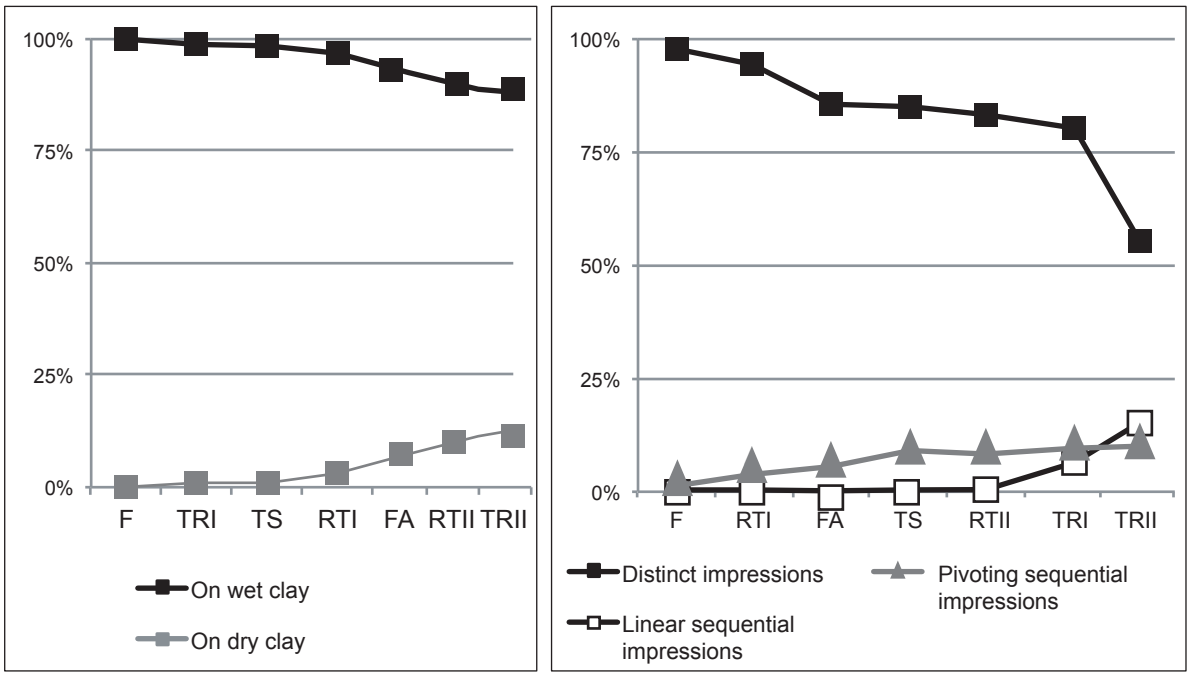


Fig. 12 – Simplified distribution of the main ceramic decorative processes of the sites from Southern Italy illustrating the shared patterns and the minority decorative processes distinguishing each assemblage.

Fig. 12 – *Distribution simplifiée des principaux procédés décoratifs des céramiques Impressa d'Italie du Sud illustrant les éléments partagés et les éléments plus minoritaires distinguant chaque assemblage.*

benchmarks. If we observe the distribution of these decorative processes in more detail, we observe that certain criteria are common to all sites (fig. 12). In other words, we can postulate that these very predominant characters in all the series correspond to the collective signature of communities. These are, in particular, distinct impressions on wet clay (> 80% except at Trasano II) and the non-zoned architecture of the decoration. In addition, the diversity of the matrices used for impressed decorations could be linked to regional styles. Conversely, other characters are very marginal in all the series and embody the individuality of assemblages in relation to each other. These are, in particular, linear or pivoting sequential impressions (*sequenza* and *rocker*) or decorations on dry clay (engraving or coloured matter). This presents a major problem in the interpretation of decoration systems which corresponds to our incapacity to distinguish between individual, functional or collective signatures. The minority elements represented here by zoned architectures, decorations on dry clay (engraving and painting) and sequential impressions can be interpreted in terms of exchanges, transfers between groups of consumers and producers, but may also signify a functional specificity of the vessels. In this way, we can consider that these 'exceptional' decorations are related to the added value of the vessel and/or its contents, and are indirect markers of still unknown social realities. Of course, the chronological factor can also be cited to explain the emergence of these new decorative styles, namely for the painting and engraving observed at Trasano II. Regardless, it appears to be fitting to question the pertinence of the use of these minority decorations to assess large-scale settlement dynamics…

Decorative *Impressa* styles of Central Adriatic Italy

First of all, it is important to underline that quantitatively significant and correctly contextualised corpuses are very rare between 5900-5600 cal. BCE in this region. Only the site of Colle Santo Stefano (Ortucchio, Abruzzes), excavated between 1988-1993 and 1997-2006 by Giovanna Radi (Angeli *et al.*, 2019), yielded sufficient data for proposing to interpret the pottery as a secondary diffusion from communities from the Tavoliere (Guadone facies) towards the Abruzzes. Indeed, numerous decorative traits provide evidence of affiliations with the Guadone facies: *protome*, *sequenza*, *rocker*, serrated shell edge impressions, etc. Colle Santo Stefano is subdivided into two phases – CSSI and CSSII (Angeli *et al.*, 2019). No difference is perceptible between these two phases in terms of the morpho-functional categories of vases. The decorative system of CSSI vases (fig. 13 and SD-9) is mainly based on a non-zoned non-syntactic structure and on the distinct impression of non-determined instruments on wet clay. Sequential impression is also used (16% of the impressed decorations). Incised (3%), modelled and coloured decorations (less than 1% respectively) are very rare. These trends do not change in the CSSII phase. But we observe, on the other hand, a decrease in the decoration of vessels (from 20% to 10% of decorated vessels), a diminution of the southern Guadone component and the appearance of specific (exogenous?) decorative styles, including marginal negative painted decoration (fig. 14 and SD-10).

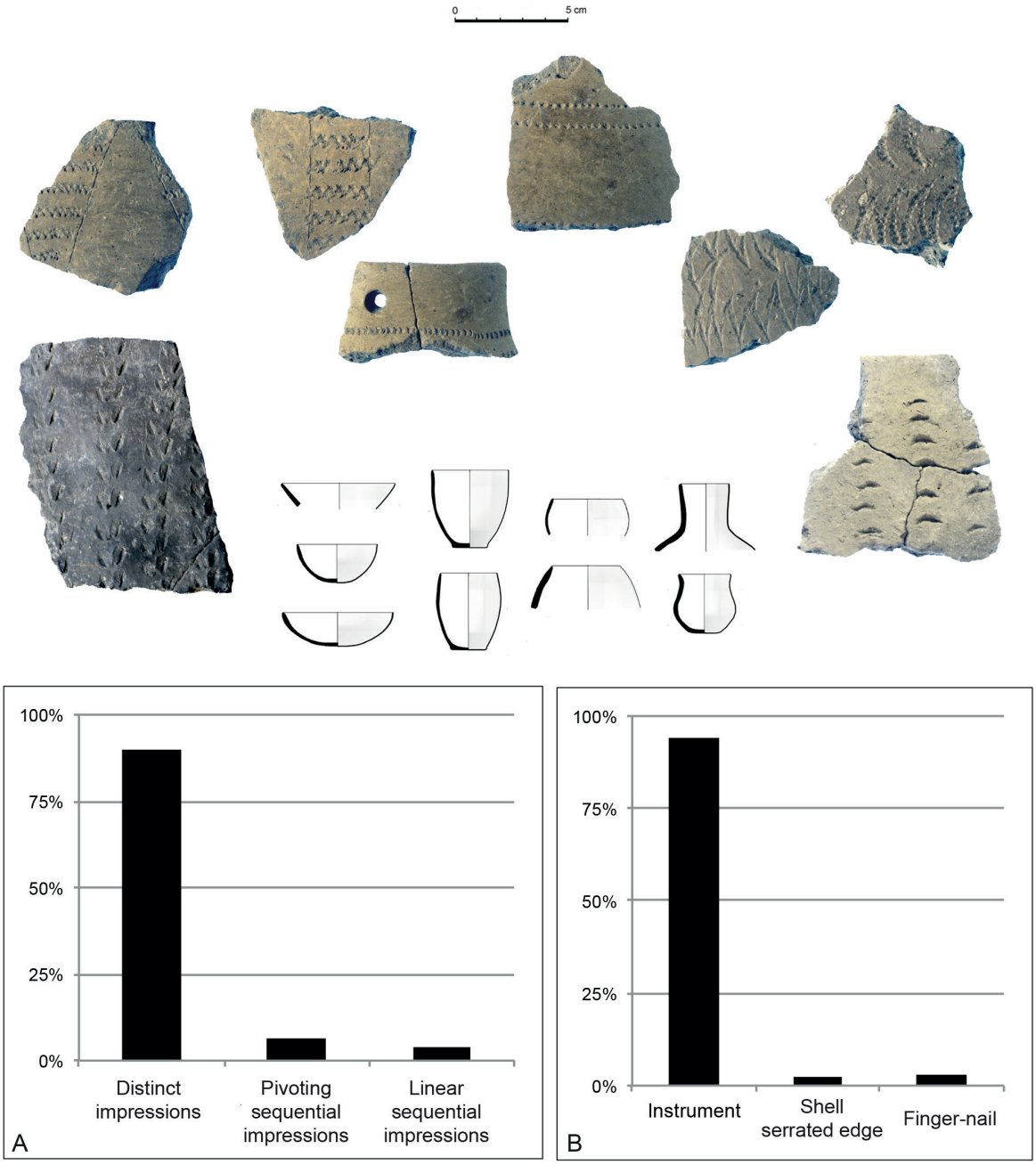


Fig. 13 – Main characteristics of ceramic decorative styles of the pottery of Colle Santo Stefano I (Ortucchio, Abruzzo). A: the different types of impression on wet clay; B: the different types of tools used for simple impressions on wet clay (the quantitative data are available in the supplementary data). After Angeli *et al.*, 2019.

Fig. 13 – *Résumé des principales caractéristiques des styles décoratifs de la céramique de Colle Santo Stefano I (Ortucchio, Abruzzes). A : les différents types d'impressions sur pâte humide ; B : les différentes matrices utilisées pour les décors d'impressions distinctes sur pâte humide (les données quantifiées sont disponibles dans les données supplémentaires). D'après Angeli* et al.*, 2019.*

The data from this site were added to the previous contingency table processed with a new FCA (fig. 15 and SD-11). We observe a good representation of the dataset of the first two factorial axes which expresses 75% of the total variance. The first factor, F1, displays 61% of the variance and receives, on the one hand, the contribution of digital-nail distinct impressions (58%) and shell distinct impressions (10%) and, on the other hand, linear sequential impressions with an instrument (12%) and distinct impressions with an instrument (11%). We can thus emphasise an opposition between decorations made with instruments and decorations made with a shell or the finger. The second factor, F2, displays 17% inertia. The results are more difficult to interpret, as the two phases of Colle Santo Stefano are not significantly different from each other or from the other sites (it is important to specify that they only contribute in a very marginal way to the structure of the FCA). This can be explained by the fact that the criteria used to establish this contingency table were chosen in accordance with the characteristics of the pottery from the South of

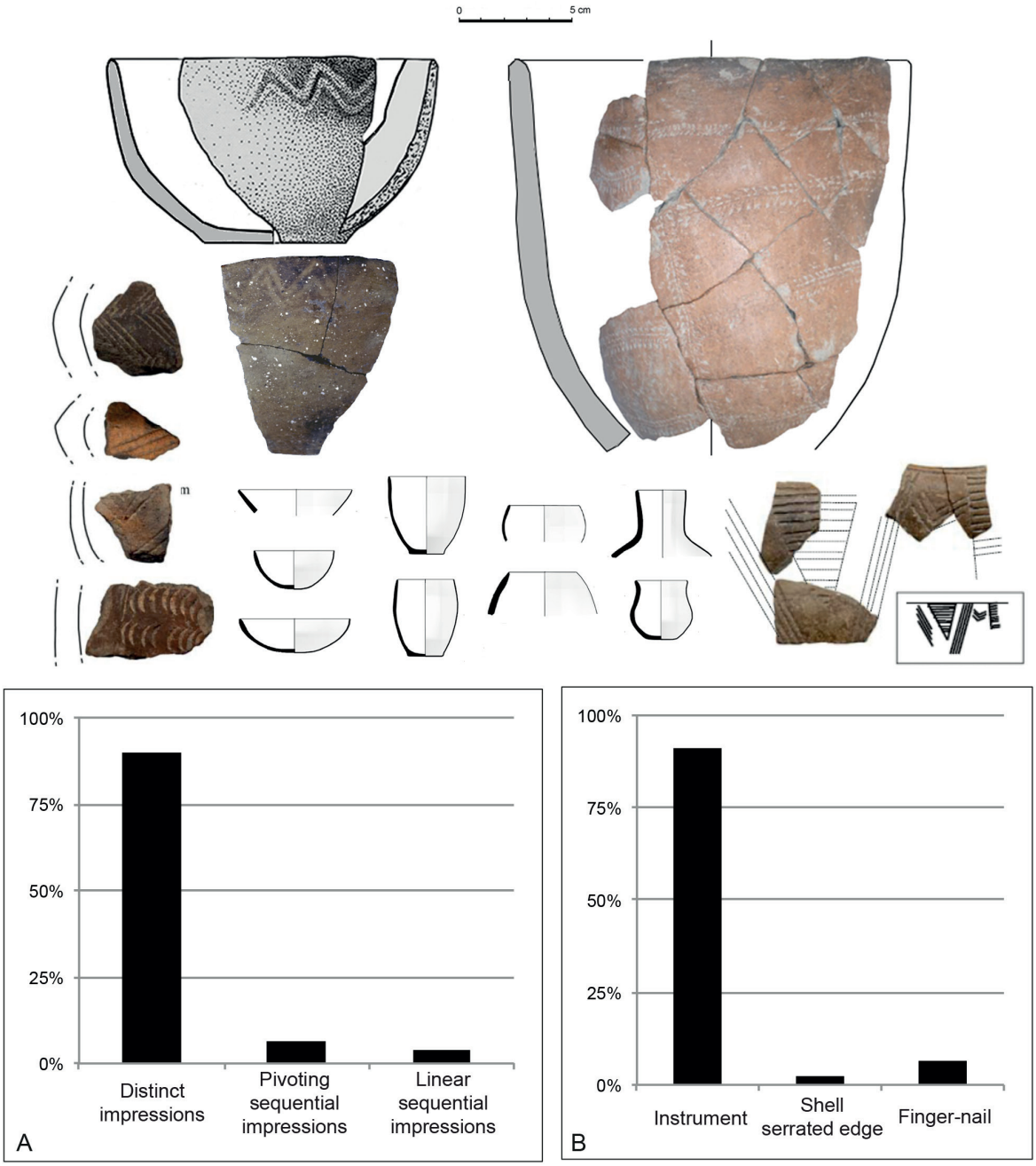


Fig. 14 – Main characteristics of ceramic decorative styles of the pottery of Colle Santo Stefano II (Ortucchio, Abruzzo). A: the different types of impression on wet clay; B: the different types of tools used for simple impressions on wet clay (the quantitative data are available in the supplementary data). After Angeli *et al.*, 2019.

Fig. 14 – *Résumé des principales caractéristiques des styles décoratifs de la céramique de Colle Santo Stefano II (Ortucchio, Abruzzes). A : les différents types d'impressions sur pâte humide ; B : les différentes matrices utilisées pour les décors d'impressions distinctes sur pâte humide (les données quantifiées sont disponibles dans les données supplémentaires). D'après Angeli* et al.*, 2019.*

Italy, for which decoration plays a very important role in the pottery system and probably in the '*chaîne opératoire*': nearly 70% of the vessels are decorated at Torre Sabea, Favella and Ripatetta and less than 20% and 10% at CSSI and CSSII. Nonetheless, we note that both the CSSI and CSSII assemblages present stylistic parallels with the dataset from Ripatetta I and Trasano I, based on the criteria used here. But these data are not sufficient for assessing stylistic links with Southern Italy.

Decorative *Impressa* styles in the Northwestern Mediterranean

As previously mentioned, *Impressa* impacts in the Northwestern Mediterranean occur very early on, in relation to the new chronometric framework and considering the distance separating them from Southern Italy. In the chronological period of interest here, the question of cultural affiliations can be assessed for five sites.

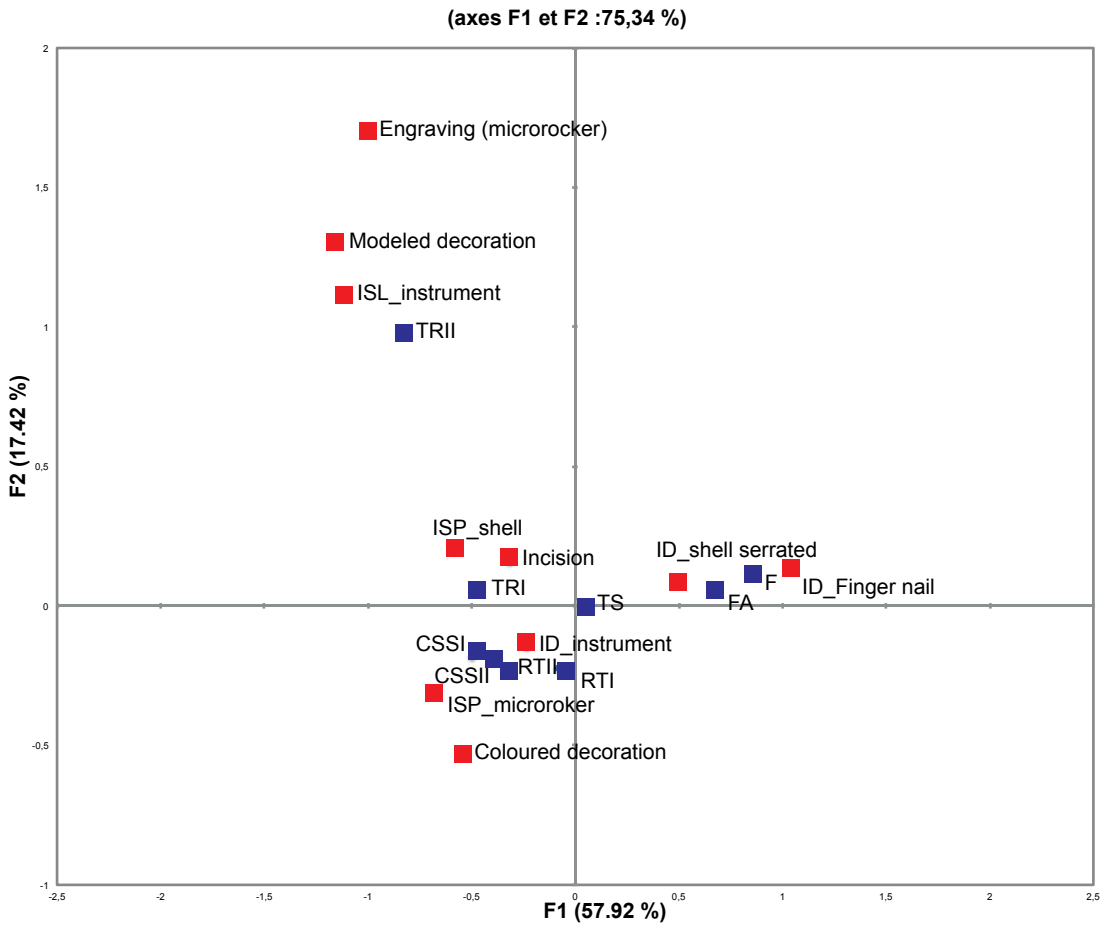


Fig. 15 – Correspondence analysis (CA) based on the counts (number of sherds) of the main ceramic decorative processes of the sites from Southern Italy and Central Adriatic Italy. Colle Santo Stefano assemblages have been considered as supplementary individuals in order to observe their situation in relation to those of Southern Italy. ID: simple impression; ISL: linear sequential impression; ISP: pivoting sequential impression. The quantitative data are available in the supplementary data.

Fig. 15 – *Analyse factorielle des correspondances (AFC) basée sur le décompte en nombre de restes des principaux procédés décoratifs des céramiques des gisements d'Italie du Sud et de l'Italie centrale adriatique. Les deux horizons de Colle Santo Stefano ont été placés en individus supplémentaires afin d'observer leur disposition par rapport aux ensembles de l'Italie du Sud. ID : impression distincte ; ISL : impression séquentielles linéaire ; ISP : impression séquentielle pivotante. Les données quantifiées sont disponibles dans les données supplémentaires.*

The site of Le Secche on the island of Giglio (Tuscany) does not provide the required contextual qualities. Indeed, the pottery from this site was merely collected without an excavation (Brandaglia, 1991). Nonetheless, this is the only site liable to be dated to 5900-5600 BCE in the Tyrrhenian zone with a significant pottery corpus for which we have direct data. For this reason, we retained it here in spite of the fact that we cannot be totally sure of the homogeneity of the corpus. The analysis of the 706 decorated fragments shows that the structuration of the decoration is covering, non-zoned non-syntactic, but also zoned in bands and panels. Decoration (fig. 16 and SD-12) is exclusively carried out on wet clay and mostly by impression (97 %). The vast majority of the impressed decorations are distinct impressions (97 %) made with a shell with a serrated edge (88 %), or an indeterminate instrument (6 %), or fingers (6 %). Linear sequential impressions are very rare (3 % of impressed decorations).

At Arene Candide, recent fieldwork directed by Roberto Maggi, Stefano Rossi and Chiara Panelli enabled us to totally revise the *Impresso-Cardial* stratigraphic sequence and to propose a temporal and cultural periodisation divided into different horizons (Panelli, 2019). The pottery corpus from the lower horizon AC1A includes 46 vases, of which 31 are decorated (236 fragments, of which 140 are decorated). The structure of the decoration is mainly covering, non-zoned syntactic. Decoration (fig. 17 and SD-13) is only carried out on wet clay and predominantly by linear sequential impressions (shell or instrument; 18 specimens; 82 % of decorated fragments) and distinct impressions (mainly shell; 12 specimens; 18 % of decorated fragments). In this latter case, the overall structure of the decoration is horizontally zoned.

At Pendimoun (Castellar, Alpes-Maritimes), a stratified rock shelter excavated by Didier Binder, in-depth work on the decoration system of vessels combined with

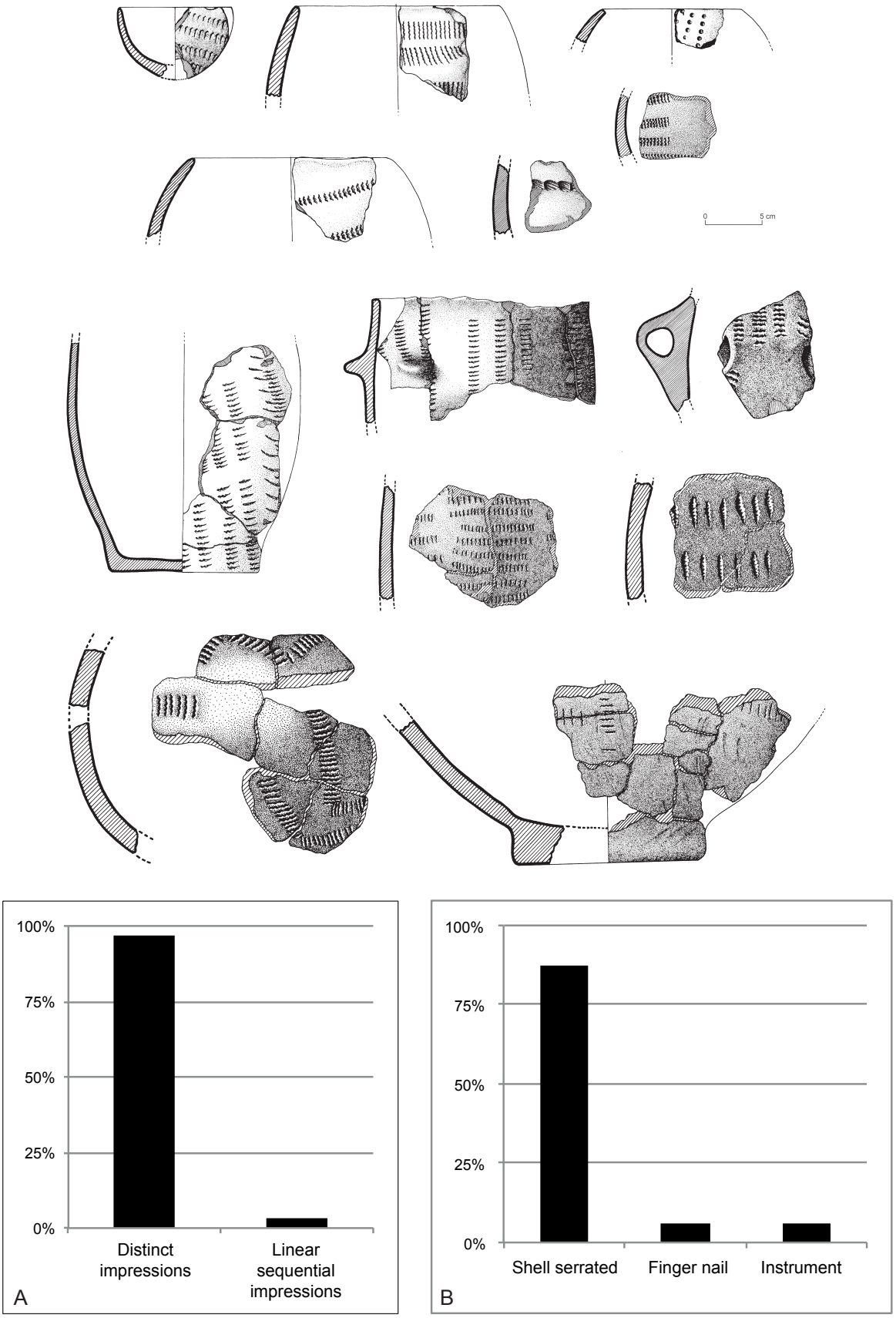


Fig. 16 – Main characteristics of ceramic decorative styles of the pottery of Le Secche (Giglio, Tuscany). A: the different types of impression on wet clay; B: the different types of tools used for simple impressions on wet clay (the quantitative data are available in the supplementary data). After Brandaglia, 1991 and pers. obs.

Fig. 16 – *Résumé des principales caractéristiques des styles décoratifs de la céramique de Le Secche (Giglio, Toscane). A : les différents types d'impressions sur pâte humide ; B : les différentes matrices utilisées pour les décors d'impressions distinctes sur pâte humide (les données quantifiées sont disponibles dans les données supplémentaires). D'après Brandaglia, 1991 et obs. pers.*

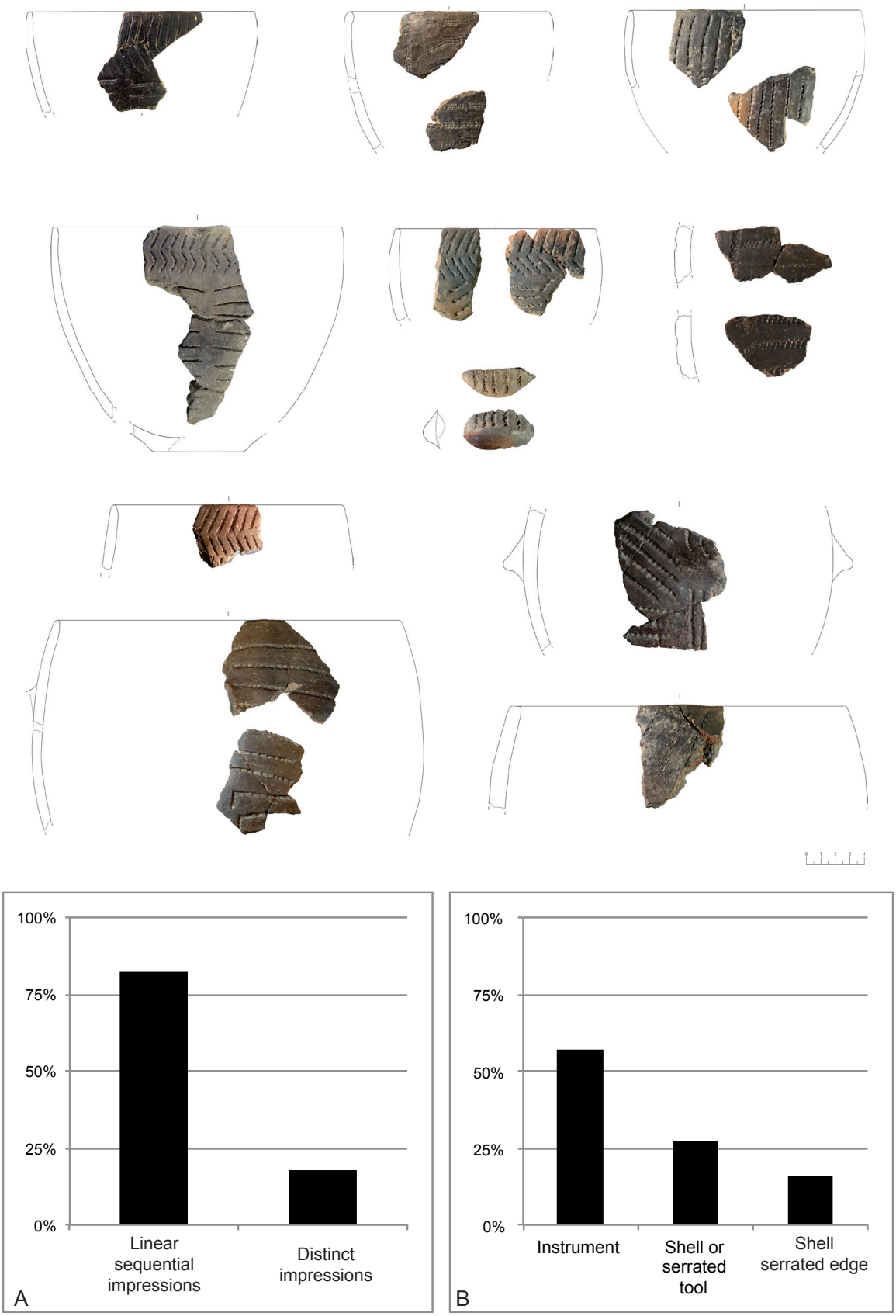
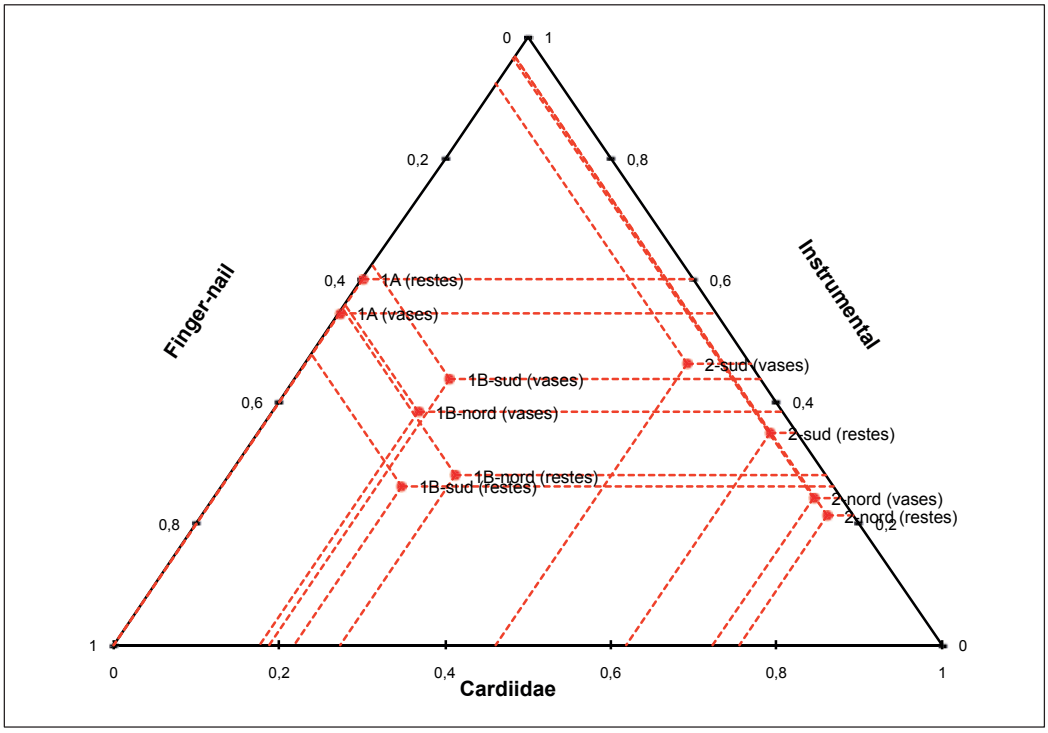


Fig. 17 – Main characteristics of ceramic decorative styles of the pottery of Arene Candide – level AC1A (Finale Ligure, Liguria). A: the different types of impression on wet clay; B: the different types of tools used for simple impressions on wet clay (the quantitative data are available in the supplementary data). After Panelli, 2019.

Fig. 17 – *Résumé des principales caractéristiques des styles décoratifs de la céramique des Arene Candide – horizon AC1A (Finale Ligure, Ligurie). A : les différents types d'impressions sur pâte humide ; B : les différentes matrices utilisées pour les décors d'impressions distinctes sur pâte humide (les données quantifiées sont disponibles dans les données supplémentaires). D'après Panelli, 2019.*



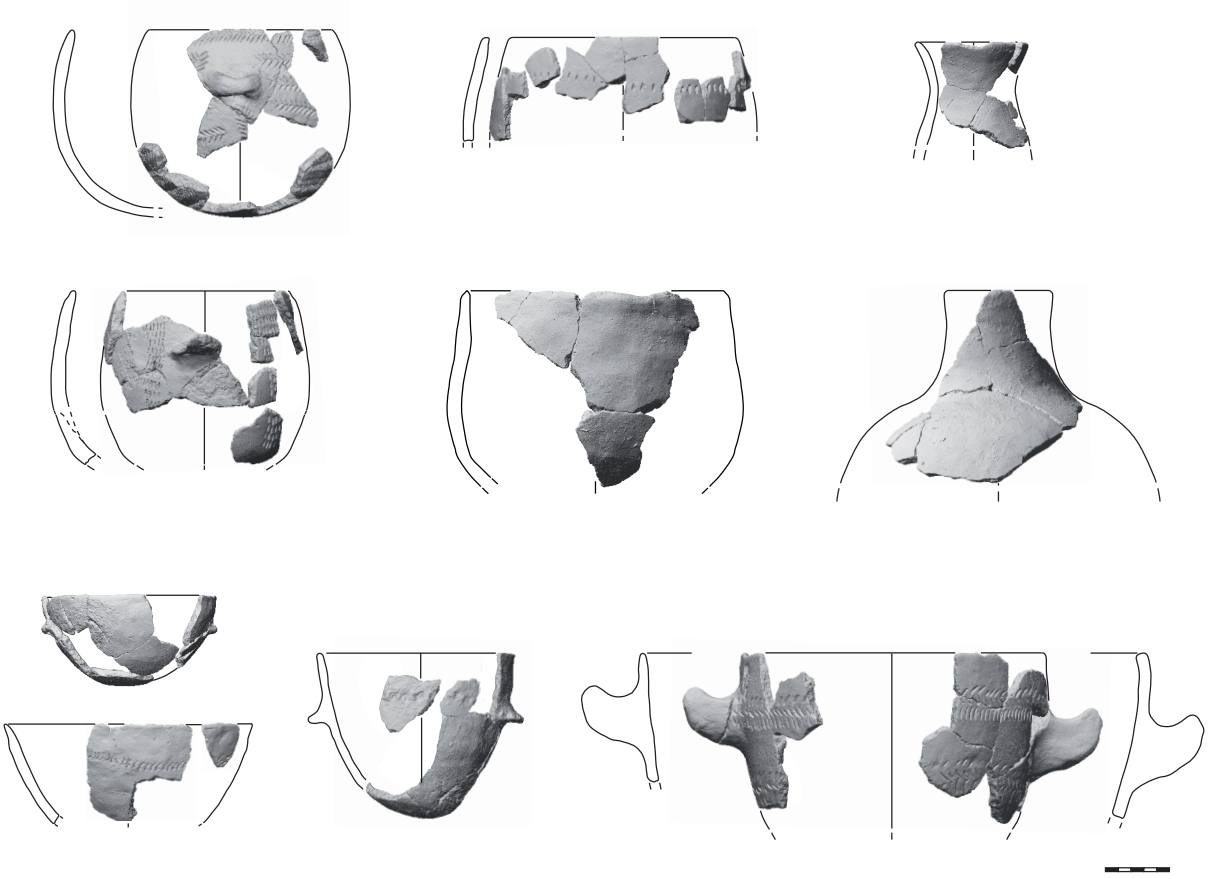


Fig. 18 – Main characteristics of ceramic decorative styles of the pottery of Pendimoun AP_1A (Castellar, Alpes-Maritimes). Ternary diagram of tools used for decoration per stratigraphic units.

Fig. 18 – *Résumé des principales caractéristiques des styles décoratifs de la céramique de Pendimoun AP_1A (Castellar, Alpes-Maritimes). Diagramme ternaire de la distribution des principales matrices utilisées pour la décoration en fonction des unités stratigraphiques.*

the chronostratigraphic data, enabled us to propose a three-stage seriation (fig. 18 and SD-14):

– AP_1A dated between 5720 and 5660 BCE; only present in the southern sector with a rather reduced number of vessels (19 specimens, including 11 decorated elements and isolated elements).
– AP_1B dated between 5650 and 5500 BCE; present in the southern (28 specimens and isolated elements) and northern sectors (66 specimens and isolated elements).
– AP_2A and 2B dated between 5480 and 5040/5020 BCE; in the southern (24 specimens and isolated elements) and northern sectors (49 specimens and isolated elements).

The differences in the decoration system are mainly identified on the basis of the types of matrices used for the impressions: digital-nail, instrument, *Cardiidae*. The AP1A stage yielded eleven decorated vessels, mostly with a decoration with a horizontal zoned structure. The decoration (fig. 18 and SD-15) is only made on wet clay by distinct impressions using an instrument or finger.

Several excavations were carried out at the site of Peiro Signado (Portiragnes, Hérault). The most recent, directed by François Briois (Briois and Manen, 2009), brought to light the remains of a domestic unit (house and adjacent pits). This site yielded a corpus of more than 3,000 fragments, 25% of which are decorated. Apart from very rare incrustations of colouring materials, decoration (fig. 19 and SD-15) was only carried out on wet clay by impressions (94%) and incision (6%). Among the impressed decorations, linear sequential impressions are predominant (78%) in relation to distinct impressions (16%). The matrices used consist of non-determined instruments (78%), shells with serrated edges or serrated instruments (20%) and fingers (2%). The general structure of decoration is covering non-zoned syntactic for linear sequential impressions and horizontally zoned for distinct impressions.

The site of Pont de Roque-Haute is an open-air site with different pits probably associated with a dwelling that no longer exists. The site was excavated by Jean Guilaine (Guilaine *et al.*, 2007), and contained a corpus of 566 fragments, 29% of which are decorated. This decoration (fig. 20 and SD-16) is only made on wet or leather-hard clay by distinct impressions (87%), linear sequential impressions (12%) and incisions (1%). The matrices used are non-determined instruments (54%), shells with serrated edges or serrated instruments (46%). The overall structure of decoration is mostly zoned in bands and panels, more rarely covering non-zoned non-syntactic.

We organised these data as a contingency table to describe their structure then to compare them to the dataset from Southern Italy. The FCA (fig. 21 and SD-17) for the Northwestern Mediterranean sites provides a good representation of the dataset on the first two factorial axes (89% expressed variability). The first factor, F1, recruits 57% of the variance and receives the contribution, on the one hand, of shell distinct impressions (30%) and distinct impressions with an instrument (10%) and, on the other hand, of linear sequential impressions with an instrument (46%). The second factor, F2, expressed 33% inertia. This analysis highlights a division between AC1A-PS on one hand and PRH-LS-AP1A on the other (the corpus from Le Secche is positioned as a supplementary data due to its low contextual reliability, which does not change the results). This division is constructed by the opposition on axis 1 between linear sequential impressions on one hand and distinct impressions on the other; the sets LS-PRH and AP1A are differentiated by the type of matrix used (respectively shell with serrated edges and instruments/fingers). This bipartition could not be integrated in quantitative terms, but we can nonetheless underline that it is also perceptible in terms of the architecture of the decorations, separating the non-zoned syntactic decorations of PS-AC1A from the non-zoned non-syntactic and zoned decorations of LS-PRH-AP1A. We must however emphasise that for the AC1A-PS group, distinct impression decorations also present a zoned organisation. This FCA does not enable us to discuss the chronological organisation of these styles; it simply expresses the partitions mentioned above.

In sum, our analysis of the shared characters of Northwestern Mediterranean *Impressa* styles (fig. 22 and SD-18), shows that decoration is systematically carried out on wet clay by impression (95% of decorations are impressed). The distinctive characters are found in the general structure of the decoration and the decorative processes used: distinct impressions (ID) on one hand and linear sequential impressions (ISL) on the other.

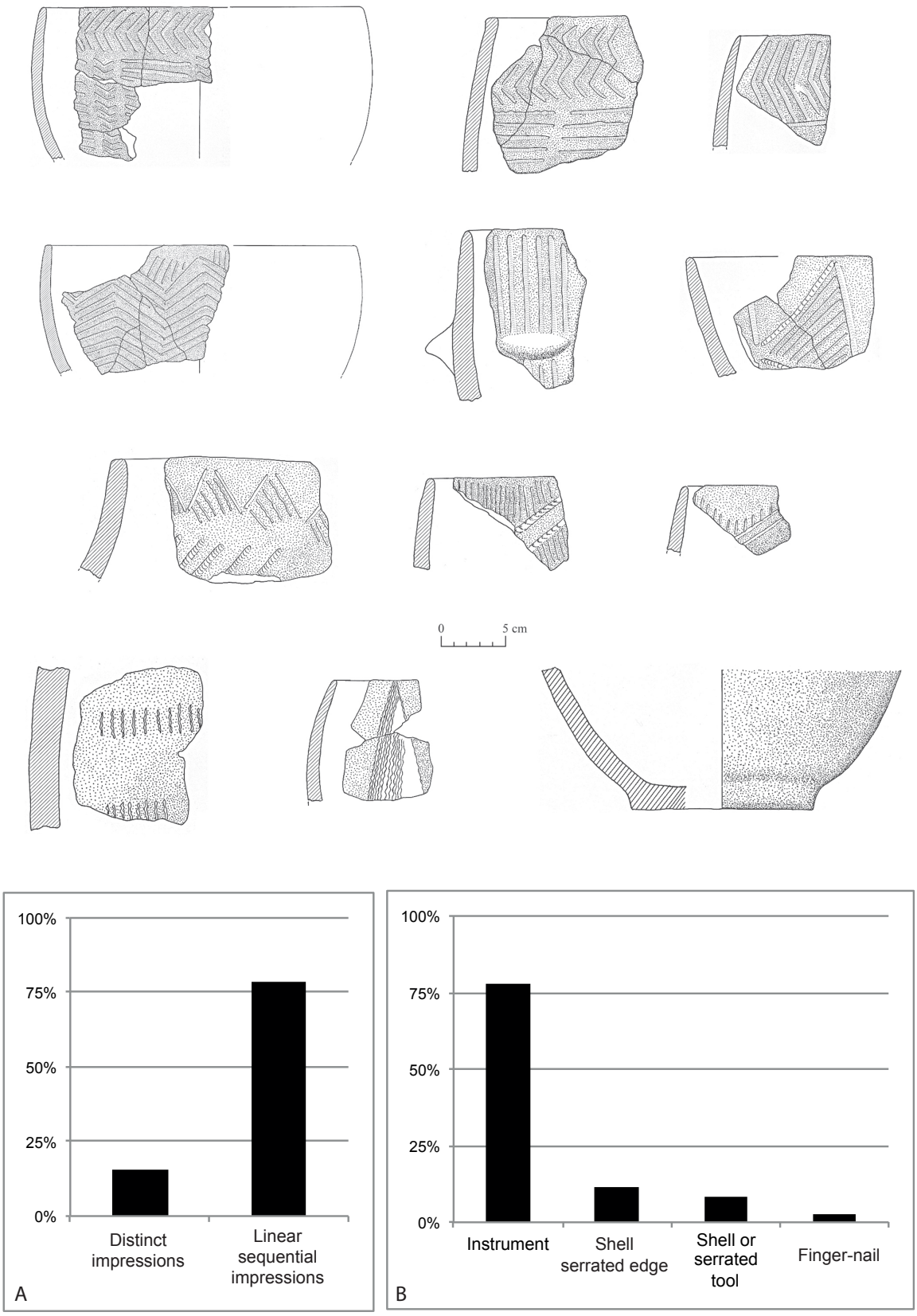


Fig. 19 – Main characteristics of ceramic decorative styles of the pottery of Peiro Signado (Portiragnes, Hérault). A: the different types of impression on wet clay; B: the different types of tools used for impressed decoration on wet clay (the quantitative data are available in the supplementary data). After Manen, 2002.

Fig. 19 – *Résumé des principales caractéristiques des styles décoratifs de la céramique Peiro Signado (Portiragnes, Hérault). A : les différents types d'impressions sur pâte humide ; B : les différentes matrices utilisées pour les décors d'impressions sur pâte humide (les données quantifiées sont disponibles dans les données supplémentaires). D'après Manen, 2002.*

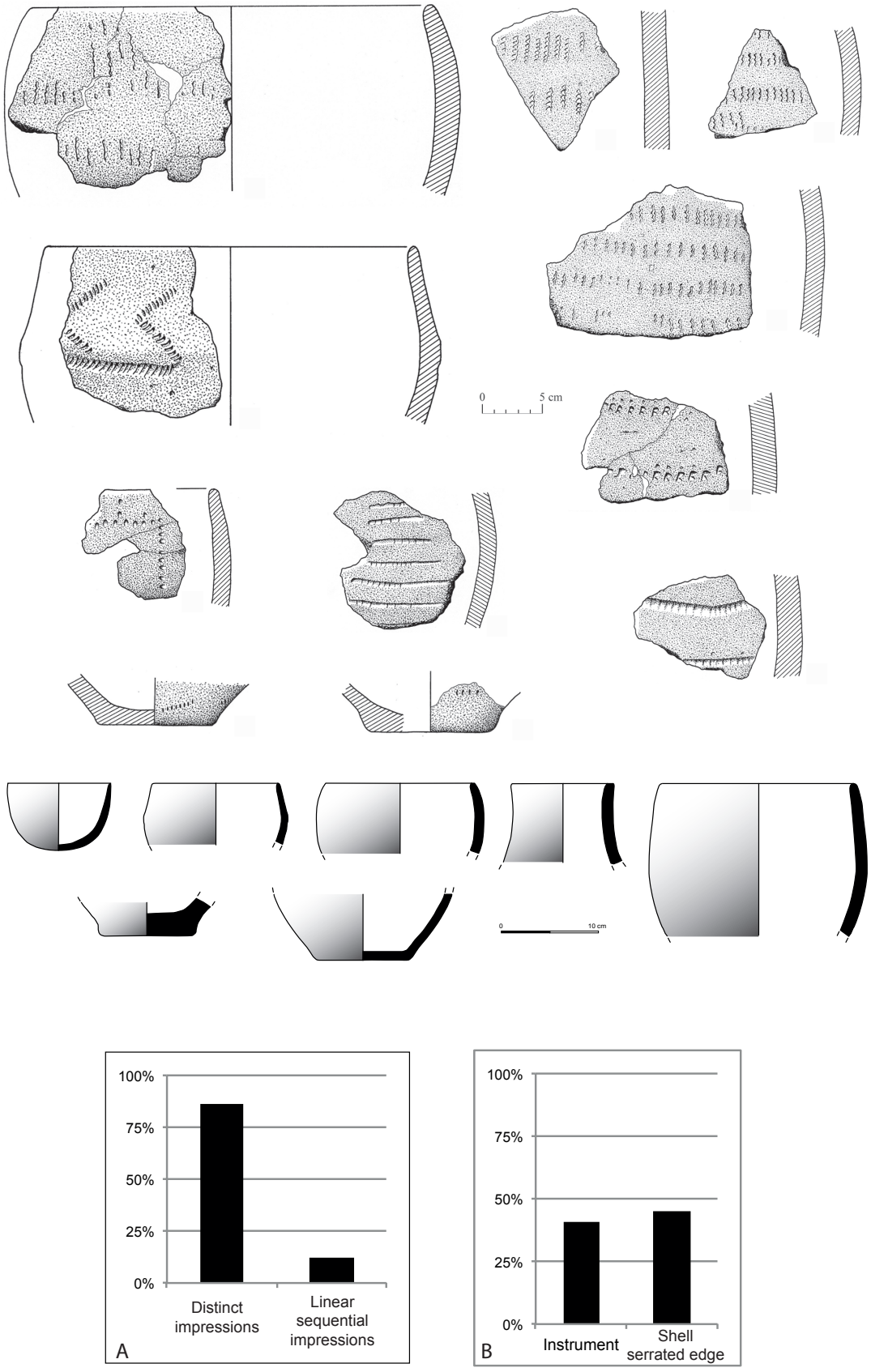


Fig. 20 – Main characteristics of ceramic decorative styles of the pottery of Pont de Roque-Haute (Portiragnes, Hérault). A: the different types of impression on wet clay; B: the different types of tools used for impressed decoration on wet clay (the quantitative data are available in the supplementary data). After Manen, 2007.

Fig. 20 – *Résumé des principales caractéristiques des styles décoratifs de la céramique Pont de Roque-Haute (Portiragnes, Hérault). A : les différents types d'impressions sur pâte humide ; B : les différentes matrices utilisées pour les décors imprimés sur pâte humide (les données quantifiées sont disponibles dans les données supplémentaires). D'après Manen, 2007.*

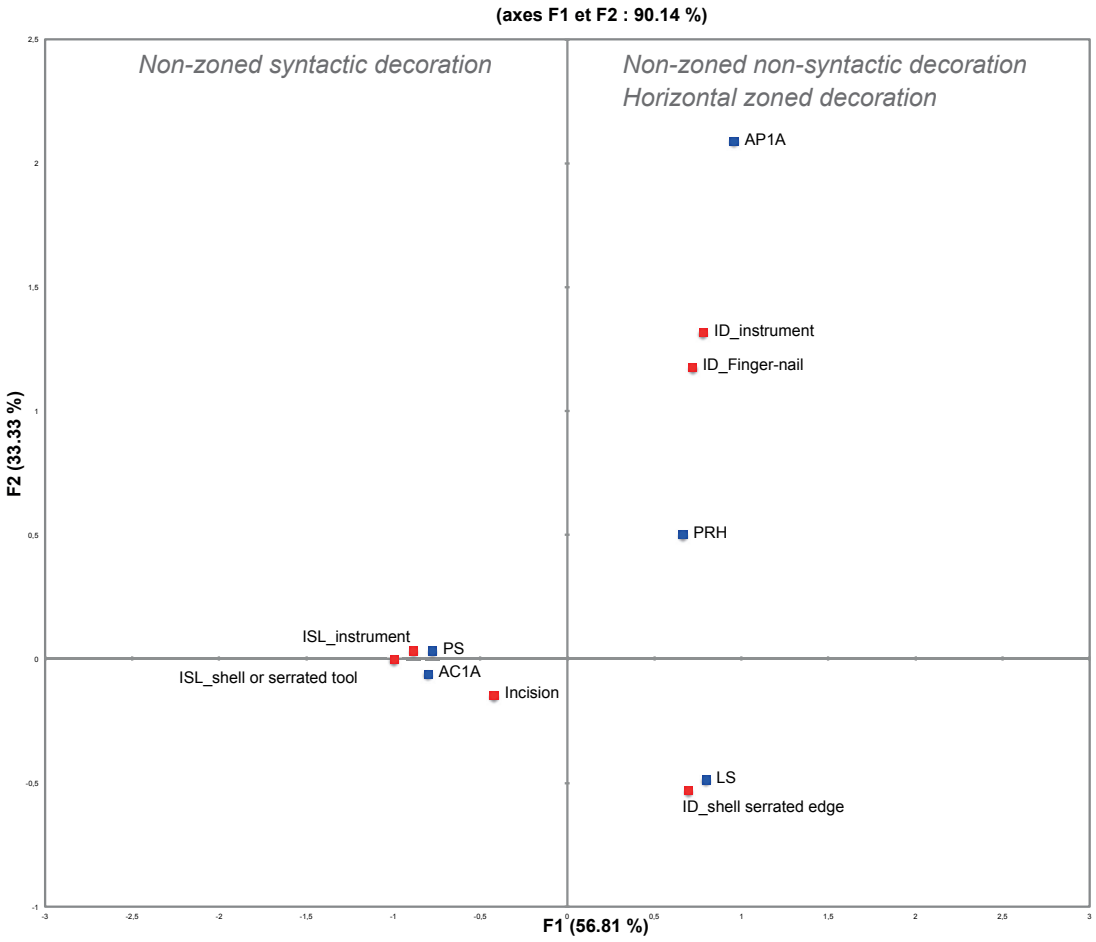


Fig. 21 – Correspondence analysis (CA) based on the counts (number of sherds) of the main ceramic decorative processes of the sites from the North-Western Mediterranean. ID: simple impression; ISL: linear sequential impression. The quantitative data are available in the supplementary data.

Fig. 21 – *Analyse factorielle des correspondances (AFC) basée sur le décompte en nombre de restes des principaux procédés décoratifs des céramiques des gisements du Nord-Ouest méditerranéen. ID : impression distincte ; ISL : impression séquentielles linéaires. Les données quantifiées sont disponibles dans les données supplémentaires.*

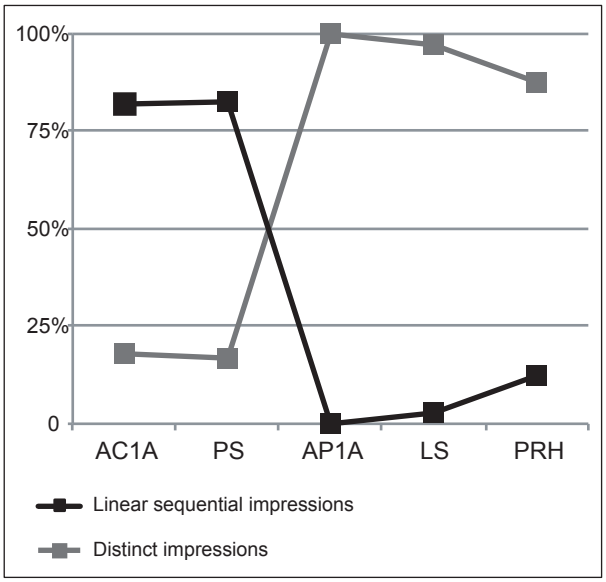


Fig. 22 – Simplified distribution of the main ceramics decorative processes of the sites from the North-Western Mediterranean illustrating shared patterns and the minority decorative processes distinguishing each assemblage.

Fig. 22 – *Distribution simplifiée des principaux procédés décoratifs des céramiques Impressa du Nord-Ouest méditerranéen illustrant les éléments partagés et les éléments plus minoritaires distinguant chaque assemblage.*

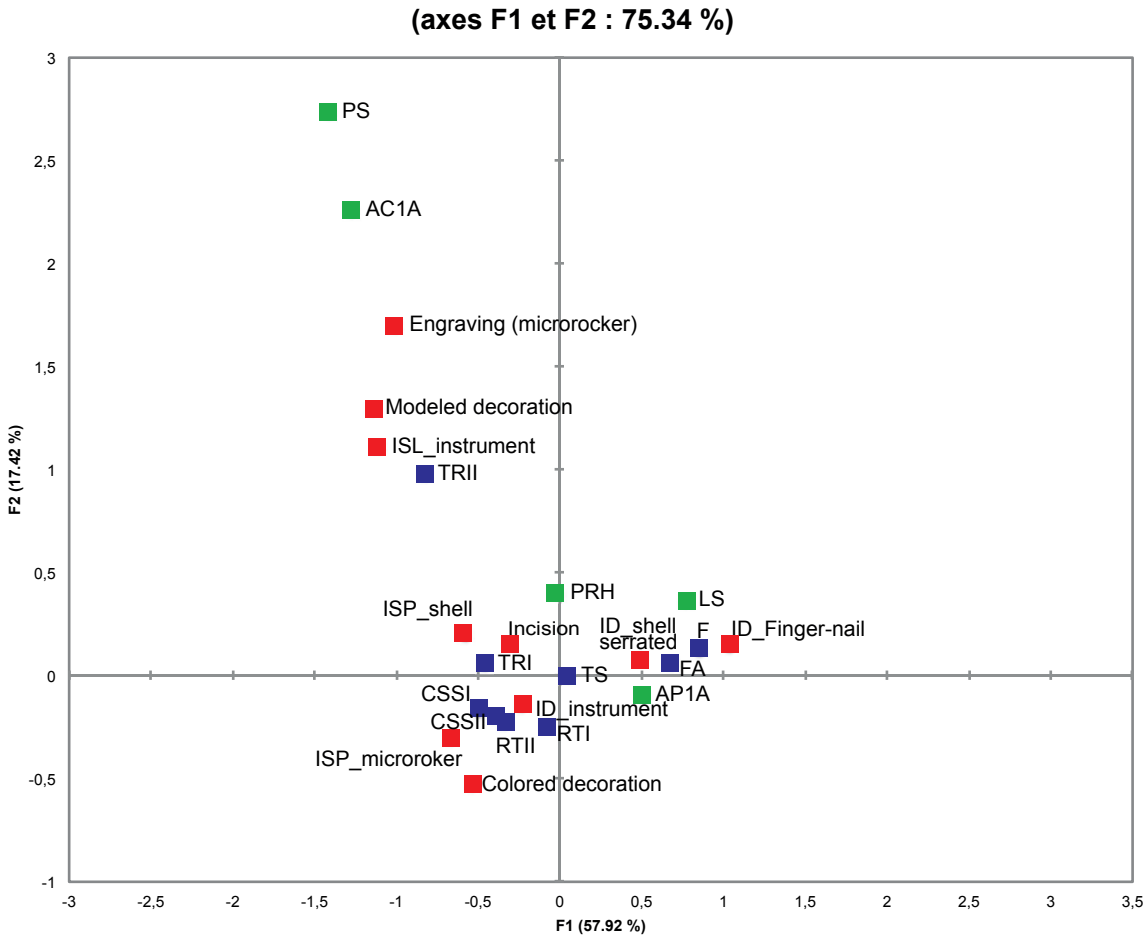


Fig. 23 – Correspondence analysis (CA) based on the counts (number of sherds) of the main ceramics decorative processes of the sites from Southern Italy, Central Adriatic Italy and the North-Western Mediterranean. The North-Western Mediterranean assemblages are considered as supplementary individuals (green square) in order to observe their situation in relation to those of Central and Southern Italy. ID: simple impression; ISL: linear sequential impression; ISP: pivoting sequential impression. The quantitative data are available in the supplementary data.

***Fig. 23** – Analyse factorielle des correspondances (AFC) basée sur le décompte en nombre de restes des principaux procédés décoratifs des céramiques des gisements d'Italie du Sud, de l'Italie centrale adriatique et du Nord-Ouest méditerranéen. Les ensembles du Nord-Ouest méditerranéens ont été placés en individus supplémentaires (carrés verts) afin d'observer leur disposition par rapport aux ensembles de l'Italie du Sud et centrale. ID : impression distincte ; ISL : impression séquentielles linéaire ; ISP : impression séquentielle pivotante. Les données quantifiées sont disponibles dans les données supplémentaires.*

DISCUSSIONS

What about affiliations?

In order to examine the potential links of the Northwestern Mediterranean sites with those of Southern and Central Italy, we combined the data for these regions in a new contingency table and processed them with a factorial correspondence analysis (fig. 23 and SD-18). The Northwestern Mediterranean sites were placed in supplementary data in order to simply observe their position in relation to those of Southern Italy. The FCA offers a good representation of the dataset on the first two factorial axes (75 % of expressed variability). The first factor, F1, shows 58 % of the variance and receives the contribution of the distinct digital-nail impressions (52 %) and distinct shell impressions (10 %) in positive mode and the linear sequential impressions with an instrument (12 %) and distinct impressions with an instrument (11 %) in negative mode. The second factor, F2, displays 17 % of the inertia and indicates a very strong contribution of engraved decorations (43 %). The chronological structuration brought to light by the FCA only regrouping data from Southern Italy (cf. *supra*) is not visible in this new analysis. Only simple, poorly-defined, partitions are observable. Based on this, several hypotheses concerning stylistic affinities can be put forward:

– the assemblage of Abri Pendimoun 1A is similar to those from Fondo Azzollini and Favella in terms of similar decorations by distinct finger impressions;
– the assemblages from Pont de Roque-Haute, Torre Sabea and Ripatetta I are similar in terms of the decorations by simple impressions made with a shell with serrated edges;
– Peiro Signado and Arene Candide 1A are placed on the margin of the group of sites, and are grouped

together in the positive part of axis 1, with linear sequential impressions.

In sum, we can thus emphasise the fact that Abri Pendimoun 1A and Pont de Roque-Haute present similarities with Southern Italy, but only on the basis of generic criteria: distinct impressions on wet clay with shells, fingers or instruments. Distinctive minority decorative elements (painting, *rocker* and engraving) which appear progressively in Southern Italy are absent in the Northwestern Mediterranean. Note that pivoting impression decorations, painting and engraving are also absent in pottery productions in the archaic Favella phase, which underlines the variability of decorative systems in Southern Italy and could explain the non-diffusion of these decorative processes towards the north. The structuration of decorations is dissimilar in both regions, as in Southern Italy, decoration very often covers the whole surface of the vase whereas in the northwest, it is generally organised into zones or panels. We can assume that the context of segmentation of the communities and group mobility (Gabriele *et al.*, 2019) partly explain why certain decorative styles do not subsequently become widespread, especially if these decorations have a particular status or are made by a restricted number of people (specialists?) in or outside the community. But too many indicators are missing in the Tyrrhenian zone, as they remain under documented for these first *Impressa* aspects, to consider other hypotheses based on more complex mechanisms (re-composition under the influx of outside factors, innovation, etc.).

The specific case of sequential impression decorations

As specified above, the decorative style of the PS and AC1A groups is totally different from the others. This style was recognised many years ago (Roudil and Soulier, 1983; Bagolini and Biagi, 1990; Maggi and Starnini, 1997; Binder and Courtin, 1987) but its specificity still raises questions regarding its status and origin. We recall its main characteristics here:

– linear sequential impressions (or "*sillon d'impressions*");
– covering decoration, syntactic geometric, extremely standardised and complex;
– possible post-firing treatment on hot surface brought to light macroscopically at Peiro Signado and Arene Candide. Preliminary biomolecular analyses conducted at Arene Candide suggest that animal fats could have been used as part of these treatments (Drieu *et al.*, 2020). In addition to these shared traits, the technical process presents high formal variability (tool function, gestures, etc.), which it would be fitting to systematise in future works. The distribution of this decorative style is very discontinuous, and quantitatively very variable, in the Northwestern Mediterranean: Le Secche, La Lucciola, Arene Candide, Grotta Pollera, Caverna della Fontana o dell'Acqua, Caverna del Morto, Riparo di Pian del Ciliegio, Caverna Mandurea and Arma di Nasino in Tuscany, Umbria and Liguria, Abri Albertini on Corsica, Caucade in Provence as well as Peiro Signado, La Farigoule and Pont de Roque-Haute in Languedoc. Although the value of these corpuses is disparate (Manen *et al.*, 2019), they define a coherent set. But it remains very difficult to find comparative elements in Southern Italy.

What about the potential archetypes/prototypes for this decorative style? Does it constitute a Western Mediterranean creation or does it have a more eastern origin? Similarities with '*a sequenza'* decoration are regularly cited. This decorative process was defined at the site of Trasano where the stratigraphic sequence enables us to observe an evolution of the technique from distinct impression with diverse matrices (instrument and shell) for Trasano I with 'continuous' impression, sequenza, for Trasano II. It is also widely used to decorate pottery at the sites of Rendina (phase II) and Guadone (Cipolloni Sampò, 1982; Guilaine *et al.*, 1991). It is true that the technical process designated here by the term "linear sequential impression" (*sillon d'impressions*) for the Northwestern Mediterranean sites presents several similarities with the *sequenza* at sites in Southern Italy. But, as is the case for the "*sillon d'impressions*", it presents high technical and formal variability, which also requires formalisation work if we wish to pursue this research on the potential '*sequenza – sillon d'impressions*' continuum. In the same way, the frequent presence of the incrustation of coloured matter and the geometrization of decorations may demonstrate partial similarities between the impressed pottery styles of Peiro Signado and Arene Candide (1A), referred to as evolved (Guadone style and *Graffito* of Materano). Nonetheless, the confirmation of these similarities requires a more precise analysis of contexts and especially a quantified analysis. This hypothesis of technical affiliation thus remains tenuous for now. Finally, the chronological layout of these southern and northern datasets is not compatible, as most of the *a sequenza* assemblages are positioned after Peiro Signado and the AC1A horizon of Arene Candide.

Is the origin of these differences between the pottery styles of the Northwestern Mediterranean and those of the *Ceramica Impressa* of Southern Italy to be found in a simple mechanism of cultural re-composition ('of genetic drift') or should we seek affiliations in other geocultural spheres? The Italian Central Adriatic side comprises very few pertinent elements of comparison, as the first Neolithic occupations are all positioned, in the current state of knowledge, after the chronological range retained for Peiro Signado and the AC1A horizon of Arene Candide. New research carried out at the site of Sidari (Corfu) recently presented the opportunity to identify a vase decorated with this typical decorative process (Guilaine *et al.*, 2016). But it remains isolated. In the Mediterranean sphere, the Sicilian and Calabrese productions of Stentinello, and namely those of San Michele di Saracena (Natali and Agrostelli, 2021), also present

several interesting similarities in terms of the technical process (linear sequential impression), but also for heated post-firing treatments. But these observations are very sporadic and should be systematised in the future in a coherent chronological framework.

CONCLUSION

To conclude this attempt to establish cultural affiliations at the beginning of the sixth millennium in the Western Mediterranean, we underline first of all that, like for manufacture techniques (Gomart, Binder, Blanc-Féraud *et al.*, this volume), it is difficult to establish links between the Southern Italian corpuses and those from the Northwestern Mediterranean. We must thus envisage an early cultural bush-like development denoting still poorly characterized historic and social trajectories. In addition, the scarcity of data in Sicily and in the Tyrrhenian and Adriatic spheres complexifies the comprehension of diffusion routes, zones of origin and intermediary benchmarks. Many sequences of the history, and thus of re-composition episodes of decorative styles, are still undeniably unknown.

We can also emphasize several biases and avenues of work to pursue in the future. Among the main biases, we can cite:

– disparate documentation and geographic areas with no data;
– a chronological resolution that requires refining;
– the representativity of pottery assemblages requires testing (equivalent nature and function?);
– the harmonisation of descriptive data for decorations needs to be improved;
– data need to be combined with the other stages of the operative chain.

Finally, it seems indispensable to develop a more general reflection on the decoration system. We can underline, for example, that decorative variability is sometimes dependent on specific morpho-functional categories in Italy (like at Favella or Trasano for example). Coarse pottery constitutes a common basis for all the groups whereas fine pottery seems to be a privileged means of expression for each of those groups. In addition, the longer life cycle of large vessels from the coarse class may explain their increased inertia. It is thus necessary to enrich the interpretative reference frameworks to treat questions of individual *versus* collective variability, mechanisms of transmission, conservatism or again of innovation in decorative traditions: what heritage stems from a neighbouring group and what is the contribution of creation to each of them? In the context of particular interest here, it is also necessary to take into consideration the question of group segmentation and maritime 'colonisation' and their consequences (loss of specialised know-how which is not diffused during group segmentation?) on the diffusion of decorative styles and their interpretation in terms of settlement dynamics.

Acknowledgments

This research was conducted as part of the following projects: CIMO "Céramiques imprimées de Méditerranée occidentale : recherches interdisciplinaires sur le Néolithique ancien" (ANR-14-CE31-009, direction D. Binder).

LIST OF SUPPLEMENTARY INFORMATION AND DATA / *LISTE DES INFORMATIONS ET DONNÉES SUPPLÉMENTAIRES*

SD-1 – Quantified data of decorative styles of Favella / *Données quantifiées des styles décoratifs de Favella*.
SD-2 – Quantified data of decorative styles of Torre Sabea / *Données quantifiées des styles décoratifs de Torre Sabea*.
SD-3 – Quantified data of decorative styles of Fondo Azzolini / *Données quantifiées des styles décoratifs de Fondo Azzolini.*
SD-4 – Quantified data of decorative styles of Trasano I / *Données quantifiées des styles décoratifs de Trasano I.*
SD-5 – Quantified data of decorative styles of Trasano II / *Données quantifiées des styles décoratifs de Trasano II.*
SD-6 – Quantified data of decorative styles of Ripatetta I / *Données quantifiées des styles décoratifs de Ripatetta I.*
SD-7 – Quantified data of decorative styles of Ripatetta II / *Données quantifiées des styles décoratifs de Ripatetta II.*
SD-8 – Quantifed data used in the CA of the main ceramic decorative processes of the sites from Southern Italy / *Données quantifies utilisées pour l'AFC des principaux procédés décoratifs des gisements du sud de l'Italie.*
SD-9 – Quantified data of decorative styles of Colle Santo Stephano I / *Données quantifiées des styles décoratifs de Colle Santo Stephano I.*
SD-10 – Quantified data of decorative styles of Colle Santo Stephano II / *Données quantifiées des styles décoratifs de Colle Santo Stephano II.*
SD-11 – Quantifed data used in the CA of the main ceramic decorative processes of the sites from Southern Italy and Central Adriatic Italy / *Données quantifies utilisées pour l'AFC des principaux procédés décoratifs des gisements du sud de l'Italie et de l'Italie centrale adriatique.*
SD-12 – Quantified data of decorative styles of Le Secche / *Données quantifiées des styles décoratifs de Le Secche.*
SD-13 – Quantified data of decorative styles of Arene Candide AC1A / *Données quantifiées des styles décoratifs de Arene Candide AC1A.*
SD-14 – Quantified data of decorative styles of Pendimoun AP_1A / *Données quantifiées des styles décoratifs de Pendimoun AP_1A.*
SD-15 – Quantified data of decorative styles of Peiro Signado / *Données quantifiées des styles décoratifs de Peiro Signado.*
SD-16 – Quantified data of decorative styles of Pont de Roque-Haute / *Données quantifiées des styles décoratifs de Pont de Roque-Haute.*

SD-17 – Quantifed data used in the CA of the main ceramic decorative processes of the sites from the North-Western Mediterranean/ *Données quantifies utilisées pour l'AFC des principaux procédés décoratifs des gisements du Nord-Ouest méditerranéen.*
SD-18 – Quantifed data used in the CA of the main ceramic decorative processes of the sites from Southern Italy and Central Adriatic Italy and the North-Western Mediterranean/ *Données quantifies utilisées pour l'AFC des principaux procédés décoratifs des gisements du sud de l'Italie et de l'Italie centrale adriatique et du Nord-Ouest méditerranéen* https://doi.org/10.34847/nkl.49f302ea

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