Supporting Information

S1. Details on the database used

The results in the main paper are based on a new database that is included as a Supp. Info. excel file and has been prepared by using the following databases/references (as suggested by a reviewer). We have calibrated all dates at https://c14.arch.ox.ac.uk/oxcal/OxCal.html (Oxcal 4.4) with 95.4% probability (curve IntCal20).


J. Fort tried to access the internet links in this paper but they did not work, so he asked Prof. Alday. His answer was that this reference and the internet links that it contains are outdated. Prof. Alday kindly provided a database with 115 early Neolithic sites in Iberia. It does not include any dates of unknown material, shell, charcoal neither human bone. Dates with standard deviation larger than 100 years were also excluded. We used the oldest date per site. The reference of each sample and/or the name of its site was used to identify its location in the database of about 11,000 Iberian sites by Alday and Mejías that is publicly available (https://sites.google.com/view/c14peninsulaiberica/daticiones-14).


This reference contains only dates on the middle Neolithic, but it provides the following citation with early Neolithic dates from the same site: Edo, M. & Antolín, F., Cova de Can Sadurní, la transformació d’un jaciment. L’episodi sepulcral del neolític postcardial. Tribuna d’Arqueologia 2013-2014, 80-104 (2016). This is the reference that we have used. The oldest Neolithic date (6,421 +- 34, Cardial) has been obtained from Fig. 3. Its date is the same as that in the previous database (1) Alday & Soto, and it also has the same laboratory reference (OxA-15488).

This paper deals with the can Sadurní and Guineu caves. The oldest Neolithic date has been obtained from table 1 and 2, respectively.


This publication includes a database (Supp. Info. 2, table 1) in which samples are classified from highest to lowest quality as: 1) domestic plants or animals, 2) other short-lived taxa (e.g., unburnt animal bones or shrubs), and 3) long-lived taxa (mainly tree wood) and burnt charcoal. We have considered samples belonging to groups 1) and 2). This database reports calibrated dates with 1σ range, but uncalibrated dates are not provided. In order to use the same probability range and calibration curve for all databases, for the sites of the samples mentioned we have used oldest Neolithic uncalibrated dates (excluding long-lived samples) from the more recent database by the same authors: Pardo-Gordó, S., García-Puchol, O., Bernabeu, J. & Diez-Castillo, A. (2018), Radiocarbon dates for the Mesolithic-Neolithic transition in Iberia, https://zenodo.org/record/3241958#.Yat3mFXMKpp.


J. Fort could not find this work, so he asked C. Manen about it. The answer was 'Unfortunately I can’t send you this pdf because it was a conference presentation, not published yet'.


This paper focuses on the Impressa, which predates the Cardial. It considers only short-lived samples, and excludes all material potentially affected by the marine or fresh-water reservoir effect (i.e., shells). We have used the dates in their Appendix (table 1). We do not include sites close to the eastern Italian coast, Corfu neither the Balkans (see their Fig. 1) because they correspond to a different area than that analyzed by us (namely, the coast from southwestern Italy to central Portugal).


This paper includes a list of 1,165 dates in Iberia (Table S1) but does not distinguish between Mesolithic and Neolithic ones, so it has not been possible to select the latter.

This database is not available as Supplementary Information in the journal webpage. It was kindly sent by A. Palmisano to J. Fort. It contains 3,885 dates from 814 sites in Eastern Iberia from 11,000 cal BP to the present. We used the dates corresponding to the early Neolithic in the areas analyzed by us (Catalonia, Valencia and Andalusia).


These authors consider Mesolithic and Neolithic dates in Iberia excluding shells, human bones and dates with standard deviation above 150 years (p. 1810). We have selected the oldest date per site from coastal areas in their Iberian Neolithic database (Table S2), which includes exclusively dates from domestic samples (p. 1812 and Fig. 6). As mentioned for database (6), we consider dates in the area we are interested in (i.e., the northern Mediterranean coast from southwestern Italy to central Portugal).


This database includes dates from Italy, France, Spain and Portugal. The authors include dates with a clear archaeological context and standard deviation equal or inferior to 100 years. They applied two additional filters (pp. 75 and 77): (1) removal of all marine and human bone samples that can be affected by fluctuations of the reservoir effect; and (2) keeping only single short-life samples to avoid old wood effects. The final database of Neolithic dates on domesticates (table 4.2) was kindly provided by O. García-Puchol in excel format. We have used the oldest date for each site. Analogously to databases (6) and (9), we consider dates in the area we are interested in (i.e., the northern Mediterranean coast from southwestern Italy to central Portugal).


The data appear in table 1 and Appendices 1-3. As already mentioned above for databases (6), (9) and (10), we do not include sites close to the eastern coast in southern Italy, Greece neither Croatia because they correspond to a different area than that analyzed by us (namely, the coast from southwestern Italy to central Portugal). Dates of poor reliability (as indicated in table 1 of this paper) were excluded before selecting the oldest date per site.

Dates were obtained from table 13.1. We selected the oldest date for each of the sites we are interested in (namely, those located in coastal areas from southwestern Italy to central Portugal). Dates classified as middle Neolithic were excluded.


The authors gathered a total of 948 Mesolithic and Neolithic radiocarbon dates of 187 sites (see their Supp. Mat. 3 file). For our purposes, the relevant dates are those classified as early Neolithic and located in coastal regions (see the map in their Fig. 1). We used the oldest date per site and excluded dates with poor reliability (for such dates, an additional column in their database states which filtering criteria are not satisfied).


This work contains 3,690 Mesolithic and Neolithic radiocarbon dates. As for database (13), the dates relevant to us are those classified as early Neolithic and located in coastal regions, and we used the oldest date per site excluding dates with poor reliability (for such dates, a column in their database gives the filtering criteria that are not satisfied).


We use the dates targeted by the authors (namely, those on material qualifying for levels 1-3 of Zilhao’s sample significance ranking, see p. 108) for the new data reported in this paper (tables 2 and 4) as well as for those previously available (table 5b).


We selected the oldest Neolithic date per site from the Supplementary Data (Appendix A) to this paper.
We include the 3 reliable Neolithic dates in this paper (table 1) but none corresponds to the Impressa, i.e., all 3 are clearly later than the earliest Neolithic dates for France (see the very interesting Fig. 2 in this paper). Excluding them would not change the earliest date in this region (France), i.e., all results would be the same.

This database is based on 3,555 dates from Epipaleolithic, Mesolithic and Neolithic sites in Europe and the Maghreb. However, these dates cannot be used for our purposes because each one was estimated by combining several dates using a Bayesian model. It makes no sense to compare them to the oldest regional dates on individual samples (which are those appearing in all other 17 databases above). This is very clear from the following example: for the site Pont de Roque-Haute, the database (6) Binder et al., Docum. Praehist. 2017 includes 5 dates (p. 76), the oldest of which is 7010+-60 uncal BP or 6005-5755 cal BC (see database (11) Manen et al, Radiocarbon 2019, table 1). However, the Bayesian model based on these 5 dates gives the result 5767-5739 cal BC (table 6 in Binder et al., Docum. Praehist. 2017), which is substantially more recent than the oldest date mentioned above (6005-5755 cal BC).

Fortunately, it has been possible to use the original dates on individual samples thanks to the fact that T. Perrin kindly provided access to his database of European and African prehistoric data (BDA, https://bda.huma-num.fr/) as well as several excel files with all original data. For each site with Neolithic dates of high reliability (classified as '1-Excellent') in the excel file 'Dates', we selected the oldest date. This file contains calibrated ranges only, so we used this calibrated range and the laboratory reference of the corresponding sample to find the uncalibrated date and its error in the BDA (https://bda.huma-num.fr/, section 'Dates'). Finally we calibrated this range again, to make sure that all dates in our database have been calibrated using the same probability (95.4%) and calibration curve (IntCal20). Analogously to other databases above [e.g., (6), (9), (10) and (11)], we consider early Neolithic dates in the area we are interested in (i.e., the northern Mediterranean coast from southwestern Italy to central Portugal).

This paper was not included in the list of the 18 references above suggested by a reviewer. In spite of this, in our database (Supp. Info. excel file) we have also included a date for the site of Caldeirão that is reported in this paper and is older than all dates for the same site in the other 18 databases above.