

Sea-crossings capacities and opportunities during prehistory: Survey and comparison between Homo species

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First sea-crossings during prehistory can be considered as tangible clues of a sophisticated communicative system, along with other behaviours such as ritual burials or art production. This conclusion can be drawn either from the technological capacities required to build rafts (Davidson & Noble 1992) or the planification and motivation necessary to undertake dangerous sea-crossings over large sea gaps (Hombert & Coupé 2002). The best known and studied example of distant sea-crossings is the one involved in the colonization of Australia by *Homo sapiens* around 60,000 years ago.

If modern behaviours become numerous at the beginning of the Upper Palaeolithic and the so-called Cultural Explosion at around 50,000 BP, scholars argue about the existence of such behaviours in earlier *Homo sapiens* (d'Errico & al 2001), and even more in earlier representatives of the *Homo* gender. Relations between language and tools, early sepultures or clues of a symbolic thought can all be discussed and put into question because of possible misinterpretations of the data. In this context, the distant colonization of Australia around 60,000 years ago already antedates the former limit of 50,000 years, but identification of possible earlier sea-crossings is valuable to better assess the emergence of modern behaviours, and consequently the development of human language.

To this end, we try to survey the possible regions on the planet where sea-crossings may have occurred during the last million of years: the Wallacea region between south-eastern Asia and Australia / New Guinea, the Gibraltar Strait and the islands of the Mediterranean Sea, the Southern and South-eastern coastlines of Asia, the Eastern coastline of Africa. Computations of visibility between an observation point and a target location and evolutions of the sea level are taken into account to determine which locations could had been populated by sea-crossings with or without visibility, or on foot during a period of lower sea-levels.

The on-going measurements reveal that many locations, including Japan or islands in the Mediterranean Sea were reachable on foot during several periods of the Pleistocene. The Andaman Islands are demonstrated to represent another example of *Homo sapiens*' sea crossings with visibility, having possibly occurred before the colonization of Australia. The only example of *Homo erectus*' sea-crossings seems to occur in the Wallacea region, where sites discovered in the island of Flores prove that *Homo erectus* had managed to cross a sea gap of around twenty kilometres more than 700,000 years ago (Morwood 2001) (Bednarick 1997). The possible crossings of the Gibraltar Strait, with presence of *Homo sapiens* in Northern Africa and *Homo neandertalensis* in today's Spain at the end of the Middle Palaeolithic also raise challenging questions about the interactions between these two species (Hublin 1992).

On the basis of these conclusions, we discuss sea-crossings as a cultural behaviour which appeared early in some human groups, and a possible cultural difference between *Homo sapiens* and earlier human species based on a greater inclination towards novelty seeking and discovery in *Homo sapiens*.