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# Haploops settlements may be indicators of shallow pockmarks activity.

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## Résumé

*Haploops* have been studied in the Bay of Concarneau from 1964 to the end of 1990 by Glemarec et Graal, (2003). Their expansion to the north has been observed along ten years but not to the north west due to the presence of *Amphiura filiformi* who destabilizes the sedimentary cover (Glémarec *et al.*, 1987). The pockmarks field in the Bay of Concarneau has been reported by Ehrhold *et al.*, (2006) in the frame of the REBENT program and eventually, the superimposition of the the pockmarks field and the *Haploops* settlement by Souron *et al.*, 2009 and confirmed by Baltzer *et al.*, 2014. Thus, it almost took 25 years to observe this spatial link. This overlapping has been observed in the Vilaine Bay, on the "Research Plateau" and since 2016 in the Loire estuary (Champilou *et al.*, 2019). In each case, there are no *Haploops* outside the pockmarks fields and the densities of pockmarks and *Haploops* tubes are particularly high. The pockmarks are active ones and are superimposed, in the 3 areas to faulted eocene calcareous outcrops. New results from geochemistry and microbiology should help us to understand the links between pockmarks and *Haploops*. In another way, *Haploops* settlement may indicate active pockmarks and their extension should follow the gas/fluid expulsion pathways. An integrate study of this specific relationship in different areas along the world, may helps us to better constrain the time-scale duration of these shallow pockmarks fields activity.

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