

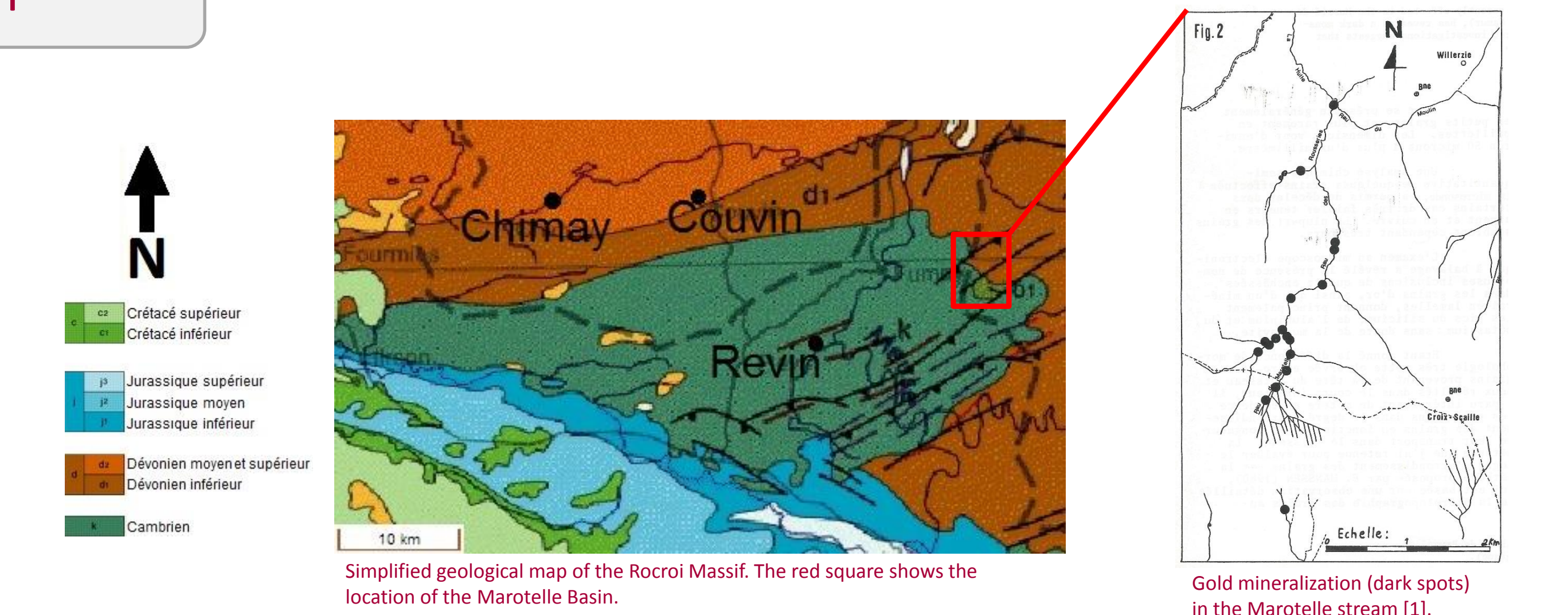
# Upper Silurian-Lower Devonian SEDEX mineralization as a primary source for alluvial gold in the Rocroi Massif, Belgium

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## Introduction

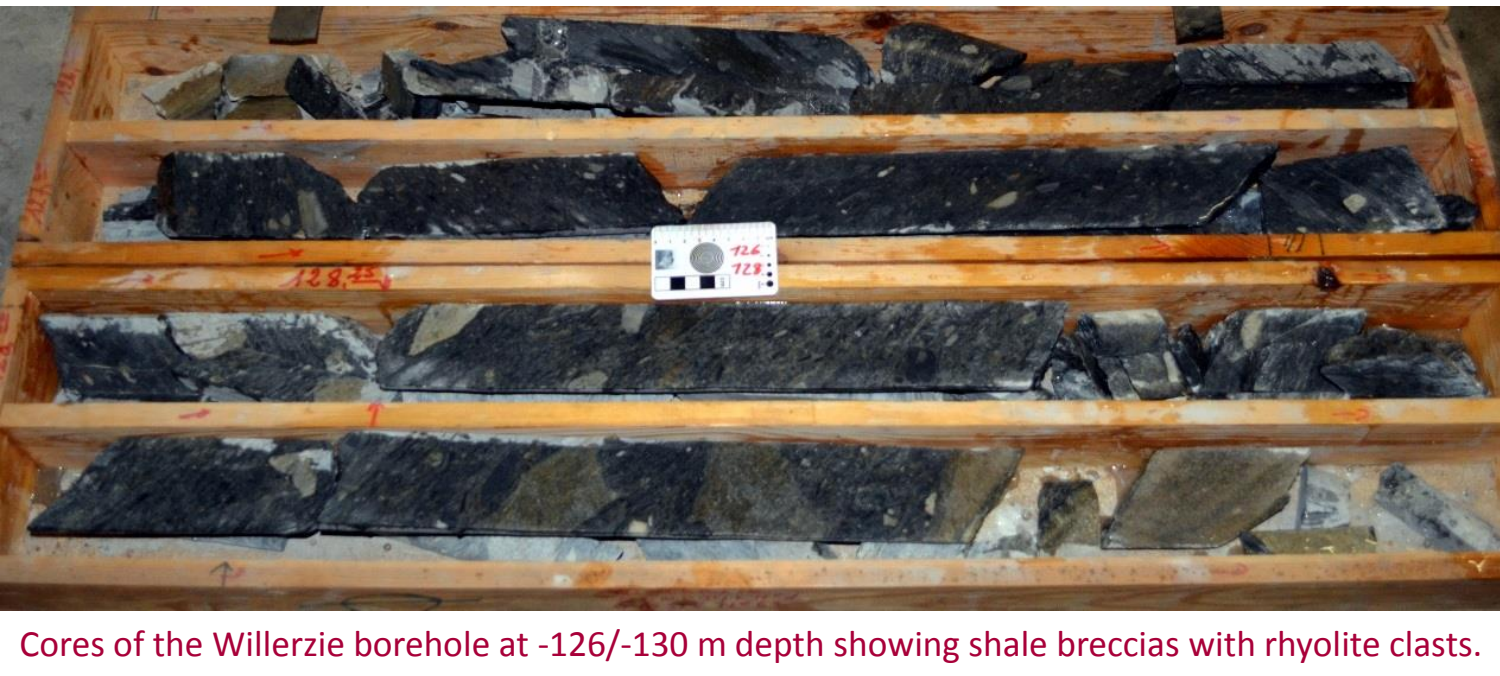
During an alluvial prospection in the 80's Nonnon has discovered gold mineralization in the Marotelle creek, eastern Rocroi Massif (1). Although the morphology of gold particles points to a nearby source in the Cambrian basement, the primary Au source was not confirmed.

This study exposes preliminary results on mineralization in eastern Rocroi Massif based on a petrography and geochemical study of samples collected in the field and in the Willerzie borehole. Two concentrates of stream sediments panned in the Marotelle and Barbaix streams were also investigated.

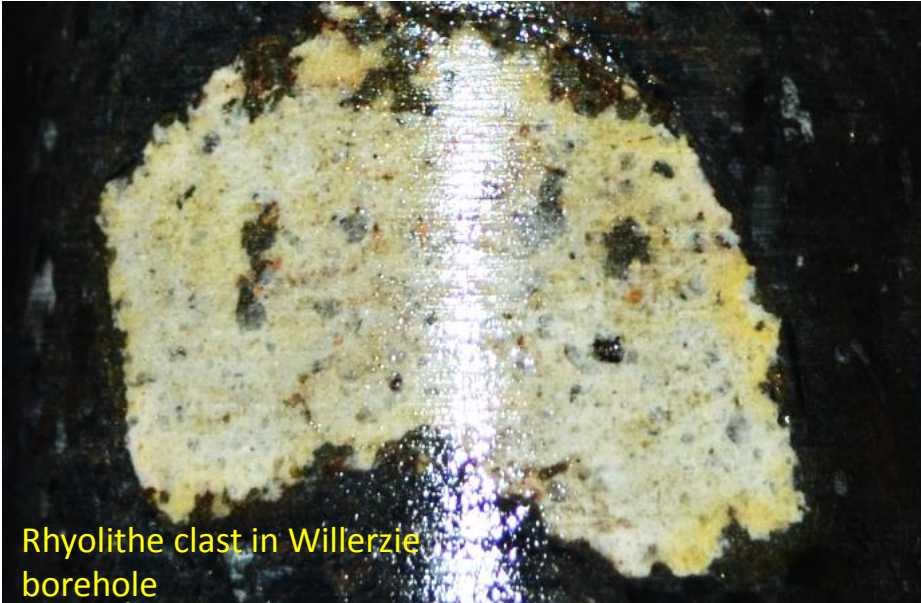


## Willerzie borehole

Mineralized quartz veins, disseminated sulphides and brecciated shale intervals with rhyolite clasts were observed at several intervals in the Upper Silurian-Lower Devonian series of the Willerzie borehole. Disseminated sulphides dominates over vein sulphides.



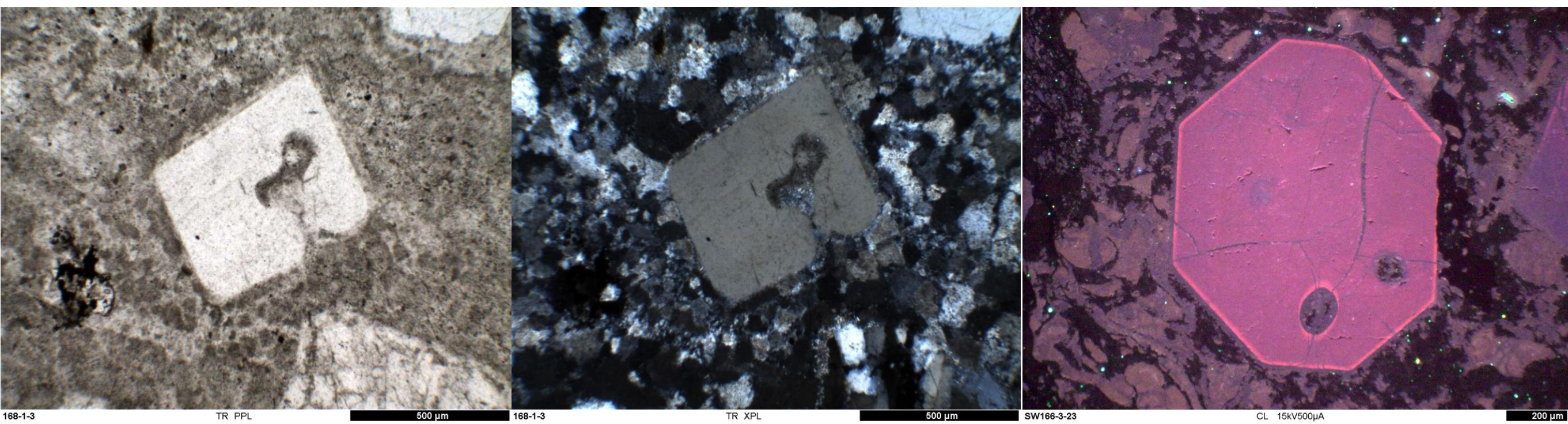
Cores of the Willerzie borehole at -126/-130 m depth showing shale breccias with rhyolite clasts.



Sulphide-bearing quartz vein in Willerzie borehole (-8,5 m)

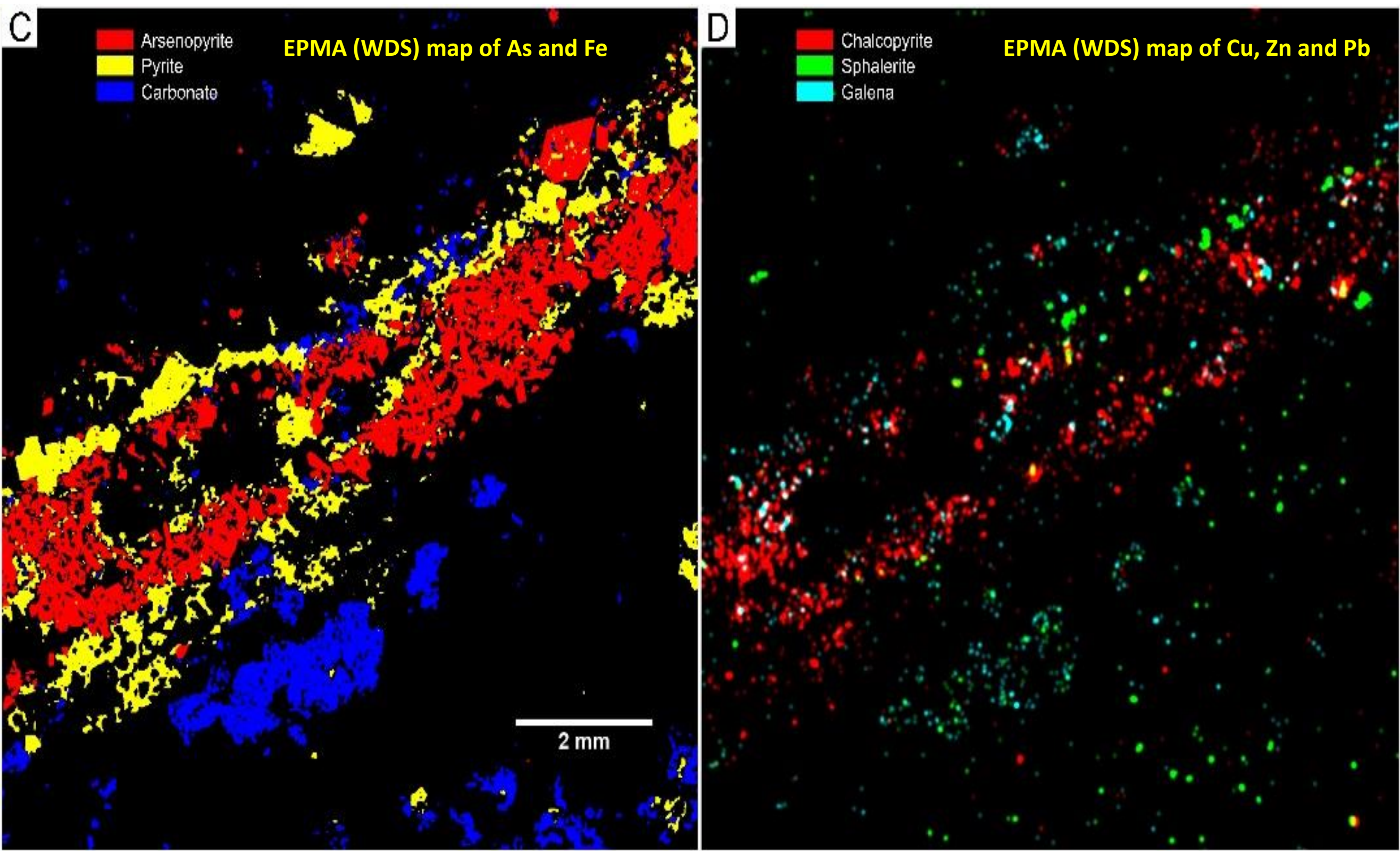
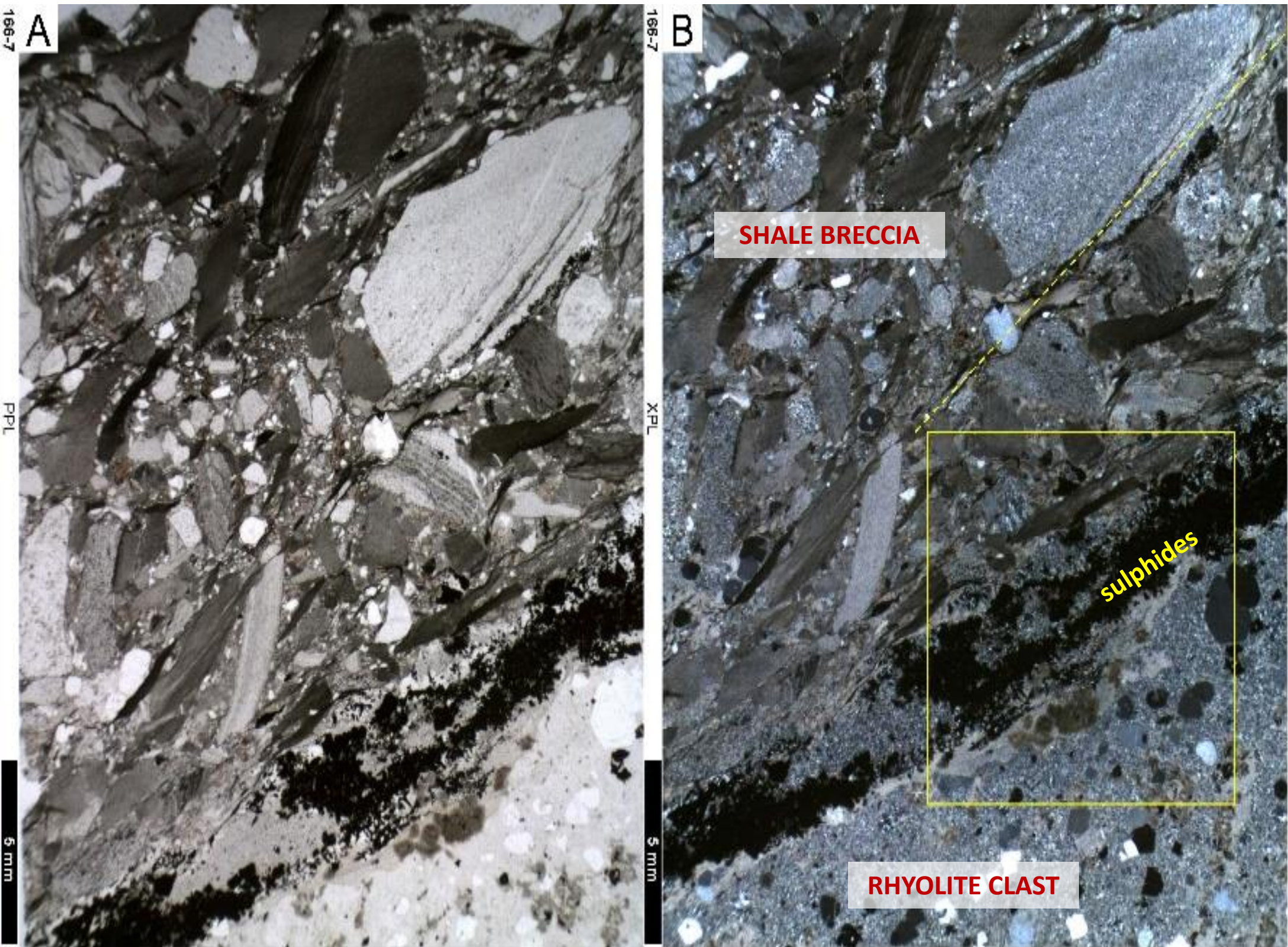
Rhyolite clast in Willerzie borehole

## Quartz phenocrysts



Besides rhyolite clasts, abundant disseminated quartz phenocrysts occur in a number of units in the Willerzie borehole. All these quartz crystals have the same characteristics (euhedral morphology, gulfs and red cathodoluminescence), which points to the same rhyolitic source.

## Electron probe analysis



Pyrite				
ID Lame	N° analyse	Au (ppm)	As (ppm)	
SW24.75	22	121	1503	
SW24.75	23	335	70	
SW25.5	12	11	1000	
SW25.5	13	44	7000	
SW25.5	14	158	199	
SW25.5	15	45	45	
SW74.7	8	345	593	
SW74.7	9	229	447	
SW166.7	10	51	504	
SW166.7	11	303	506	
Moyenne		164,2	1226,7	
Barbaix fin	1	138	389	
Barbaix fin	2	202	585	
Barbaix fin	3	300	1079	
Barbaix fin	4	54	414	
Barbaix fin	5	47	0	
Maro Fin	6	337	540	
Maro Fin	7	153	380	
Moyenne		175,9	483,9	

Arsénopyrite			
ID Lame	N° analyse	Au (ppm)	
SW25.5	6	168	
SW25.5	7	148	
SW25.5	8	152	
SW25.5	9	227	
SW166.7	1	91	
SW166.7	2	125	
SW166.7	3	431	
SW166.7	4	0	
SW166.7	5	183	
Moyenne		173,9	

EPMA analyses of trace-elements in pyrite and arsenopyrite from Willerzie borehole and stream sediments. Values in red are below detection limit.

Electron probe analysis showed diverse sulphides (As, Zn, Pb, Cu and Fe), Fe-carbonates and chlorite, which are disseminated but also concentrated around rhyolite clasts or in veins. Most sulphides are fine-grained and intimately mixed together.

Electron probe analysis of gold in sulphides yielded up to 431 ppm Au in arsenopyrite. Pyrite also contains appreciable amounts of gold. However, in sulphides collected in Lower Devonian rocks in the northern Rocroi Massif, where no placers have been found to date, the concentration in gold is less.

## Conclusions

The above observations suggest the disseminated sulphides in the Willerzie borehole deposited as very fine-grained precipitates in a sedimentary environment under the influence of volcanic activity. This environment could relate to a Upper Silurian-Lower Devonian sedimentary-exhalative (SEDEX) system. Based on their significant gold content, disseminated sulphides could be the primary source for alluvial gold in the Rocroi Massif. Vein sulphides could result from a later remobilization of the primary disseminated sulphides but this needs further investigation.

## References

- (1) Nonnon, M. (1984). Découverte de monazite grise en nodules et d'or alluvionnaire dans le massif de la Croix-Scaille. *Bul letin de la Société Belge de Géologie*, 93 (4), pp. 307-314.
- (2) Kovalev, K., Kalinin, Y., Naumov, E., Kolesnikova, M. et Korolyuk, V. (2011). Gold-bearing arsenopyrite in eastern Kazakhstan gold-sulfide deposits. *Russian Geology and Geophysics*, 52 (2), pp. 178-192.