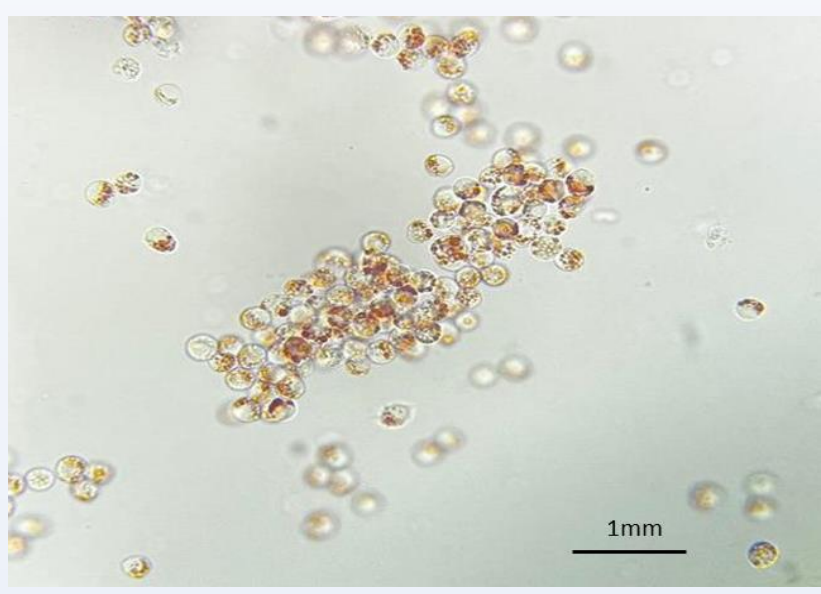




HEMATODINIUM PEREZI (DINOPHYCEAE: SYNDINIALES), PARASITE OF AN INVASIVE BLUE CRAB: ON THE AFRICAN ATLANTIC COAST



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Callinectes sapidus Rathbun, 1896 (Fig. 1), native to the western Atlantic, has been established in various Moroccan coastal ecosystems since 2017. It hosts several parasites both in native and introduced areas, particularly the dinoflagellates *Hematodinium*, which are known to cause significant mortality in crustaceans.



Figure 1. Male specimen of *Callinectes sapidus* collected from Atlantic coast of Morocco. Scale bar = 5 cm.

In winter 2023, 36 specimens of *C. sapidus* were sampled from two Ramsar sites on the Moroccan Atlantic, namely Merja Zerga and Oualidia Lagoons (Fig. 2). All 36 specimens were screened to detect the presence of parasites in their hemolymph by staining fresh hemolymph smears and by PCR based on the amplification of the parasite's first internal transcribed spacer region (ITS1).

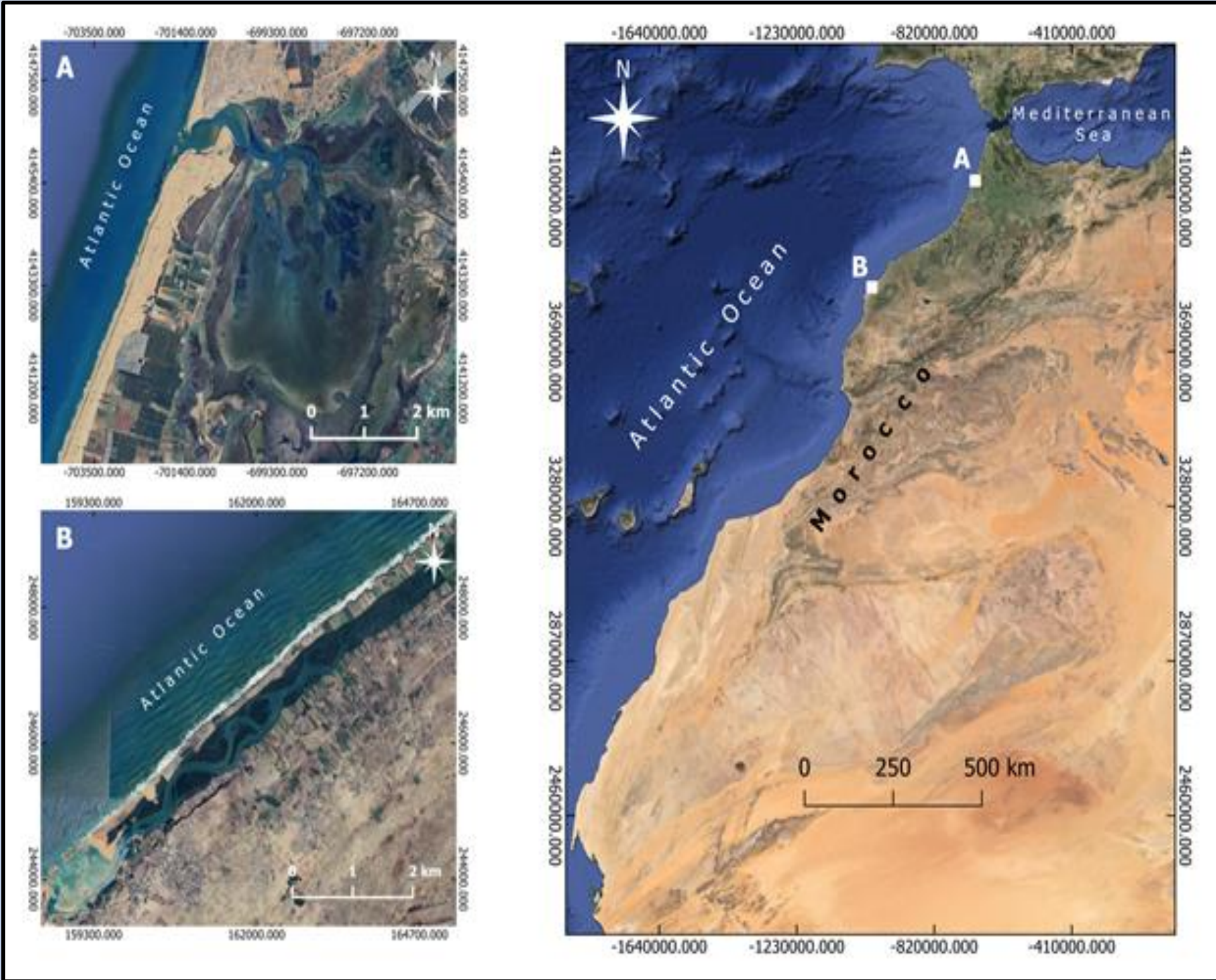


Figure 2. Map showing the localization of Merja Zerga (A) and Oualidia (B) Lagoons on the Moroccan Atlantic.

Based on staining fresh hemolymph smears, 19 blue crab individuals were infected by the parasite, with a prevalence of 75% in Merja Zerga Lagoon and 25% in Oualidia Lagoon (Fig. 3). PCR analysis revealed that 13 *C. sapidus* individuals were infected in Merja Zerga (prevalence: 65%) and four in Oualidia (25%). The 15 ITS1 rDNA sequences that were generated (13 sequences from Merja Zerga Lagoon and 2 from Oualidia Lagoon) produced an alignment of a 295 bp long fragment. Comparison with the previously published DNA sequences confirmed the presence of *H. perezii* (Fig. 4).

Table 1. Range of uncorrected pairwise genetic distances sequences of *Hematodinium perezii* infecting *Callinectes sapidus* collected from Morocco and all published sequences from GenBank.

	Merja Zerga	Oualidia	South Coast of England	China	USA	Greece
Merja Zerga Lagoon	-	-	-	-	-	-
Oualidia Lagoon	0% - 0.6%	-	-	-	-	-
South Coast of England EF065716, EF065708, EF065711	0.6% - 1.3%	0.6% - 1.3%	-	-	-	-
China KX244637, KX244644, KX244641	1.7% - 2.3%	1.7% - 2.3%	1% - 1.7%	-	-	-
USA KX244634	3.7% - 4%	3.7% - 4%	3.6% - 4%	3.7% - 4%	-	-
Greece PP056127	0.2% - 1.3%	0.2% - 1.3%	0.3% - 0.6%	1.3% - 1.7%	3.4%	-

The present study documents the first detection of *Hematodinium perezii* (Dinophyceae: Syndiniales) on the African Atlantic coast and also represents the first report of this (or any) parasite in the invasive non-native crab *Callinectes sapidus* in Morocco.

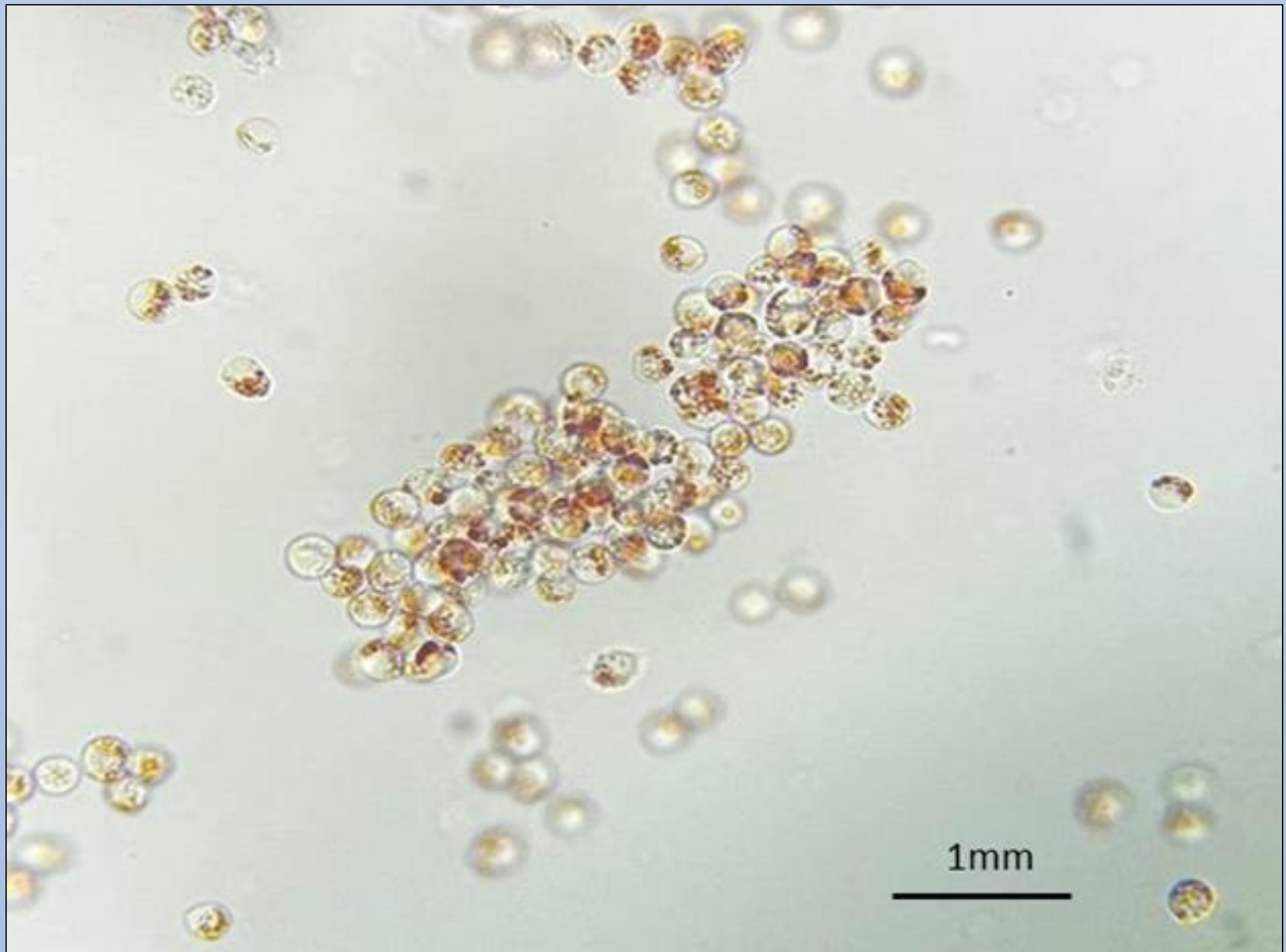


Figure 3. Microscopic examination of hemolymph smears from *Callinectes sapidus* infected with *Hematodinium* (40X)

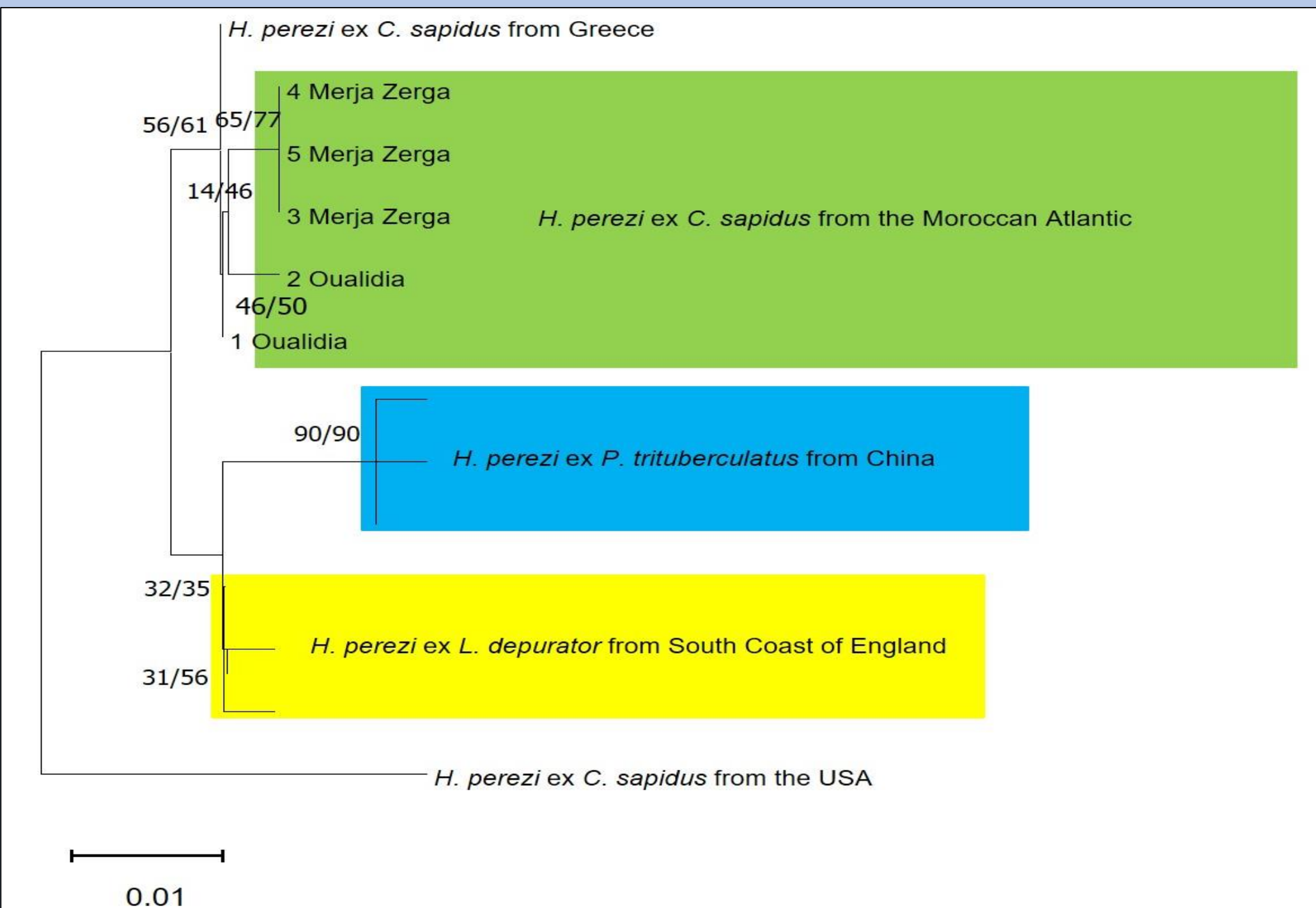


Figure 4. Phylogram constructed using maximum likelihood (ML) and neighbour-joining (NJ) methods based on ITS1 sequences of *Hematodinium perezii*

Microscopic examination is simple but requires expertise to identify abnormal cells resembling *Hematodinium* and may miss low-level infections. PCR assay is more sensitive and more specific, detecting *Hematodinium* at levels undetectable by microscopy. Overall, a combination of morphological and molecular characterization is often used to ensure accurate detection and monitoring of *Hematodinium* infections in crustacean populations.

Ultimately, in-depth studies are desirable to understand the interactions between blue crab and its parasites in Morocco's coastal zones, and to assess their effects on native biodiversity, associated marine diseases and human health risks. In addition, screening native crabs in Morocco will enable us to verify parasite spillover and spillback events.

References

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