

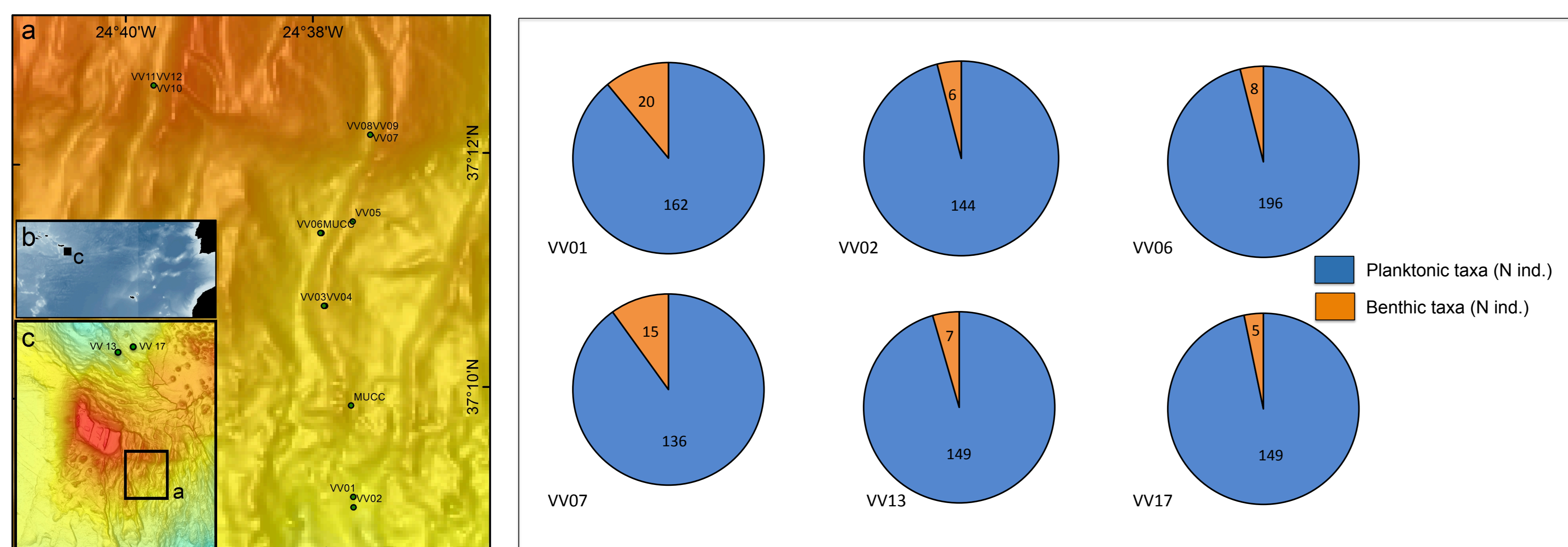
Preliminary study on the foraminiferal assemblages from the MEDWAVES cruise

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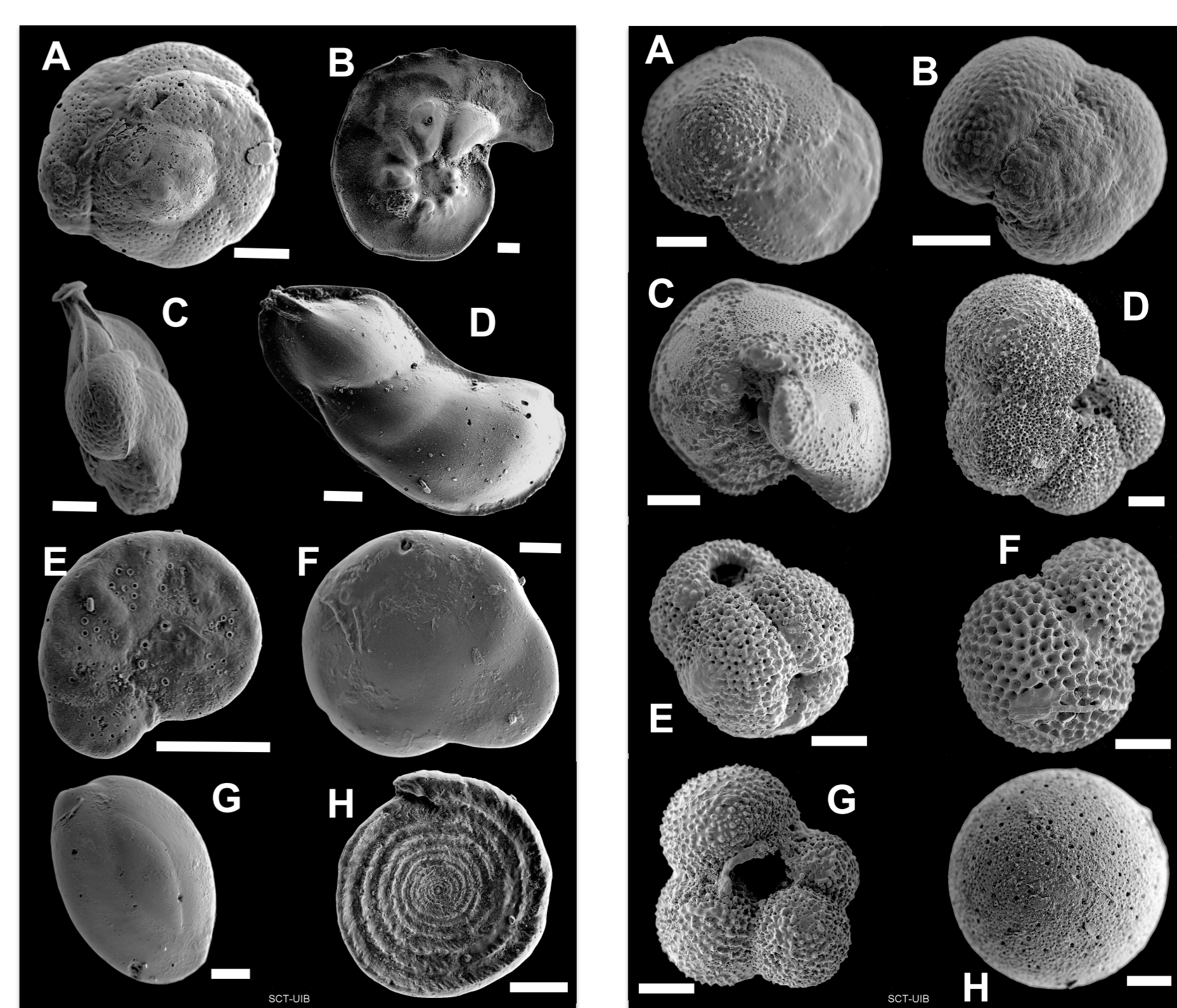
Abstract

A total of 996 foraminiferal specimens corresponding to 23 planktonic species (934 individuals) and 45 benthic species (62 individuals) have been classified from six samples obtained around the Formigas archipelago during the MEDWAVES cruise, between 1,536 mwd and 1,018 mwd. Three main groups are distinguished among the planktonic taxa based on their distribution along the water column: shallow-water species (< 50 mwd), intermediate-water taxa (50 - 100 mwd) and deep-water forms (> 100 mwd). Deep-water forms are dominant in all samples (46% - 73%) and are mostly represented by the temperate species *Globorotalia inflata* and the subtropical species *Gr. truncatulinoides*. Intermediate-water species range between 15% and 22% in abundance and mostly correspond to subtropical forms (*Orbulina universa* and *Globigerinella siphonifera*) and temperate taxa (*Globigerina bulloides*). The least abundant planktonic foraminifera are the shallow-water forms (10% - 20%) that live above the permanent thermocline and are mostly represented by symbiont-bearing, tropical *Globigerinoides sacculifer*. Benthic foraminifera include many species but scarcely represented and correspond to both reworked and *in-situ* dwelling forms. The most conspicuous species correspond to hyaline taxa (60% - 100%) that are mostly represented by *Valvulineria bradyana*, *Cibicides* spp., *Lagena* spp., *Hyalinea balthica*, *Discanomalina coronata*, *Spirillina limbata* and *Neolenticulina peregrina*. It is remarkable the occurrence of the species *Hyrokkina sarcophaga*, a parasitic species common in deep-water corals. Porcelaneous taxa are less frequent and mostly represented by *Triloculina tricarinata*, *Spirosigmollina* sp. and *Spiroptalmidium* sp. Finally, agglutinate foraminifera are rare and mostly correspond to the species *Siphonotextularia concava*.

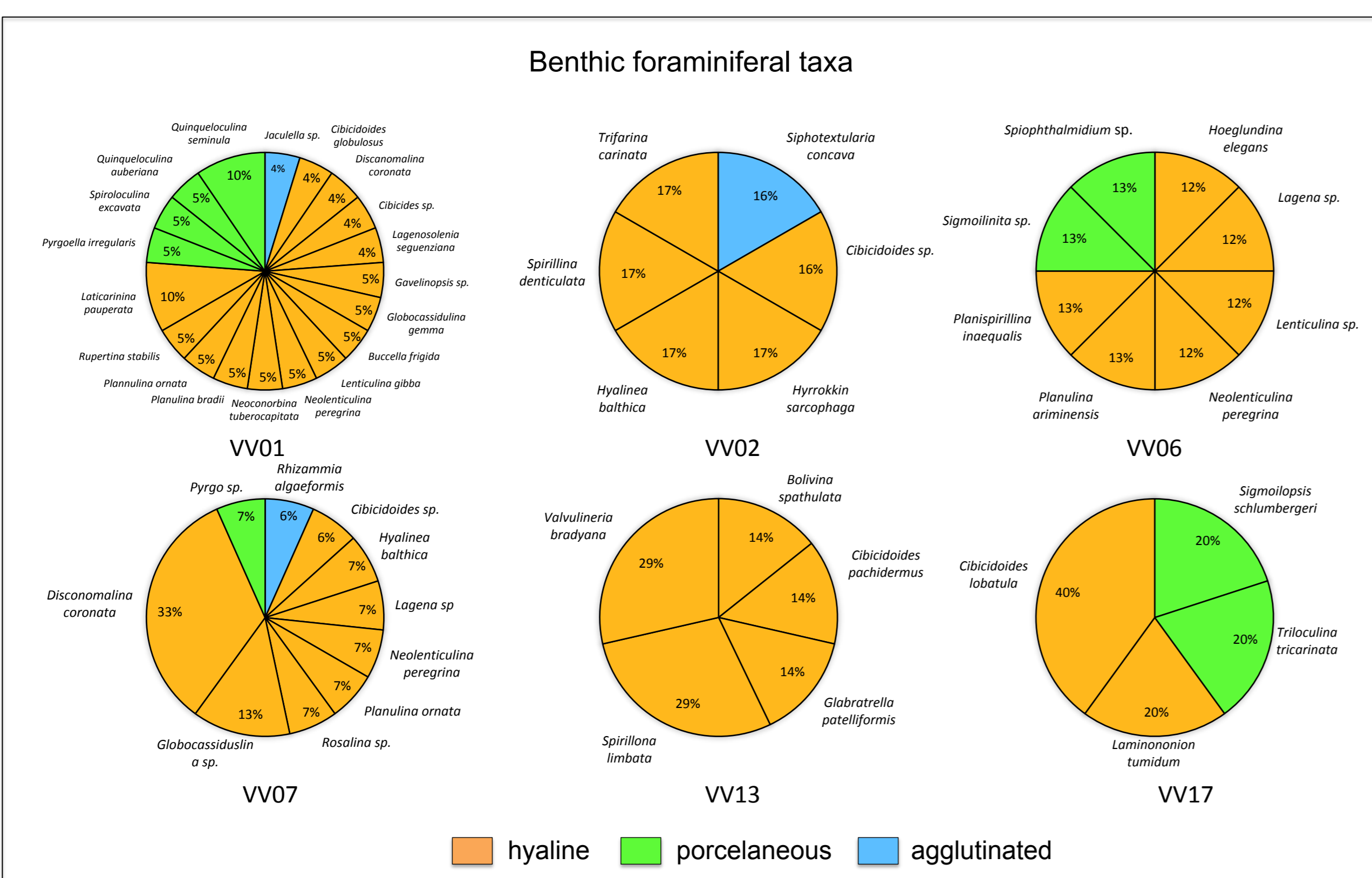
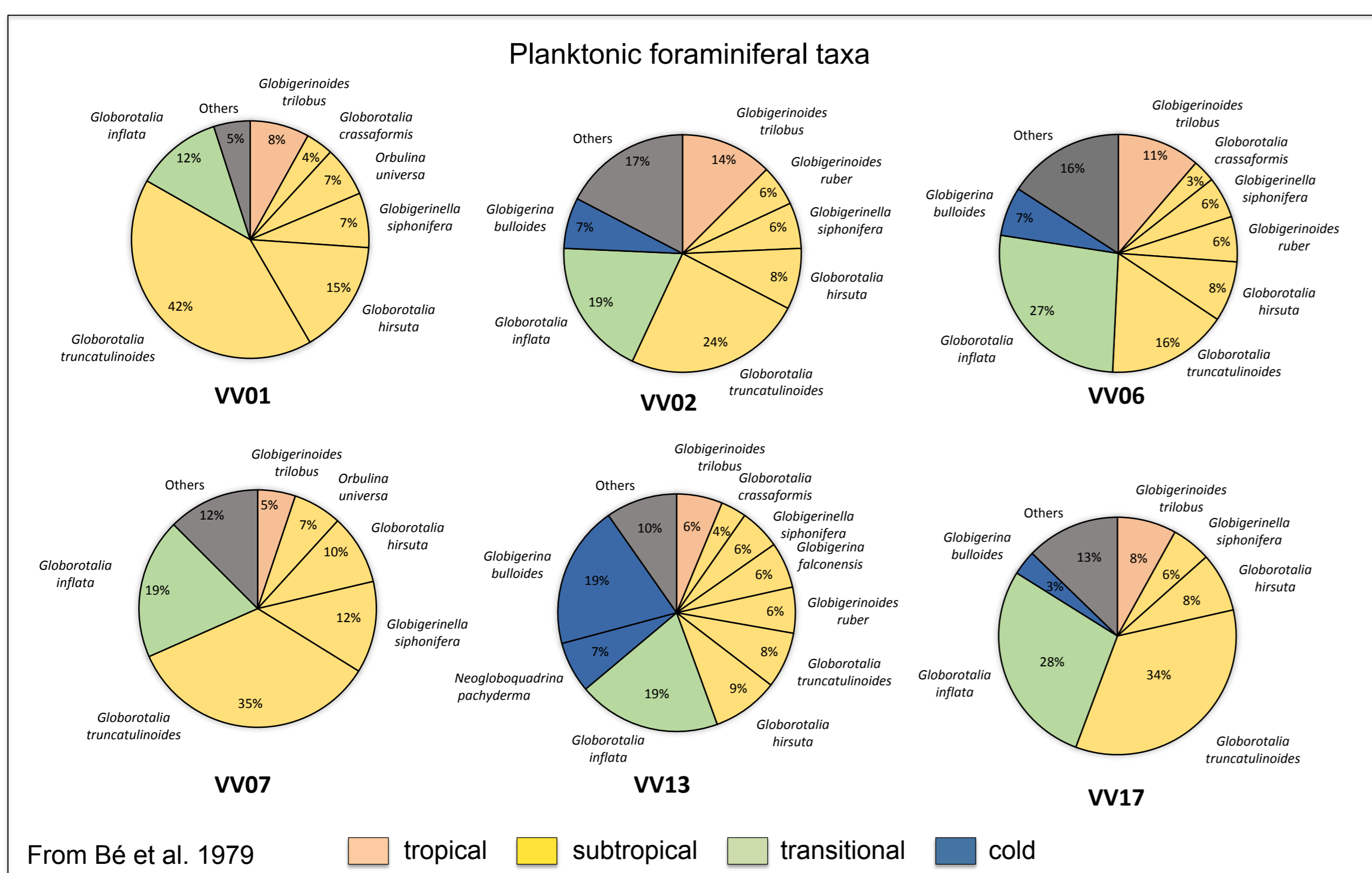


▲ Sampling sites at Formigas seamount.

▲ Planktonic vs. benthic species ratio for each sample. Values refer to the number of specimens.



▲ LEFT. Benthic species found in Formigas seamount samples. A. *Hyrokkina sarcophaga*. B. *Laticarinina pauperata*. C. *Trifarina carinata*. D. *Neolenticulina peregrina*. E. *Hyalinea balthica*. F. *Hoenglundina elegans*. G. *Quinqueloculina seminula*. H. *Spirillina limbata*. RIGHT. Planktonic species found in Formigas seamount samples. A. *Globorotalia hirsuta* (spiral view). B. *Globorotalia inflata* (spiral view). C. *Globorotalia truncatulinoides* (umbilical view). D. *Globigerinella siphonifera*. E. *Globigerinoides ruber*. F. *Globigerinoides sacculifer*. G. *Globigerina bulloides* (umbilical view). H. *Orbulina universa*.



▲ ABOVE. Planktonic foraminiferal taxa and their climatic affinities. The mixture of tropical to cold species reflects the influence of the different water masses. The presence of abundant *G. inflata* (>90% sinistral forms) is indicative of the influence of the Mediterranean Outflow Waters. BELOW. Benthic foraminiferal taxa according to the shell composition. Hyaline forms are dominant. Most species are deep water dwellers (i.e. *Lenticulina*, *Hyalinea*, *Discanomalina*, *Valvulineria*, etc.). Parasitic forms such as *Hyrokkina sarcophaga* also occur.

Table showing all the planktonic taxa and their relative abundances. Sampling depth is indicated below the sample name. "Shallow" refers to < 50 mwd, "intermediate" corresponds to 50 - 100 mwd and "deep" to > 100 mwd.

Taxa	Temp.	Depth	VV01 (%) 1535 mwd N = 161	VV02 (%) 1536 mwd N = 144	VV06 (%) 1246 mwd N = 195	VV07 (%) 1018 mwd N = 136	VV13 (%) 1415 mwd N = 149	VV17 (%) 1324 mwd N = 149
<i>Globigerinoides sacculifer</i> (Brady, 1877)	tropical	shallow	8	12	11	5	6	8
<i>Globigerinoides tenellus</i> Parker, 1958	tropical	shallow						1
<i>Globoturborotalita rubescens</i> (Hofker, 1956)	tropical	shallow				1		1
<i>Beella digitata</i> (Brady, 1879)	tropical	Intermediate					1	
<i>Neogloboquadrina dutertrei</i> (d'Orbigny, 1839)	tropical	Intermediate		3	2		3	1
<i>Pulleniatina obliquiloculata</i> (Parker & Jones, 1862)	tropical	Intermediate	2	3	2	1	2	2
<i>Globorotalia menardii</i> (d'Orbigny in Parker, Jones & Brady, 1865)	tropical	Deep				1	1	
<i>Globigerinoides conglobatus</i> (Brady, 1879)	subtropical	shallow	2	2	1	3		2
<i>Globigerinoides ruber</i> (d'Orbigny, 1839)	subtropical	shallow		6	6	1	6	1
<i>Globigerina falcensis</i> Blow, 1959	subtropical	Intermediate		1	2		6	1
<i>Globigerinella siphonifera</i> (d'Orbigny, 1839)	subtropical	Intermediate		1				
<i>Orbulina universa</i> d'Orbigny, 1839	subtropical	Intermediate	7	6	6	12	5	5
<i>Globigerinita glutinata</i> (Egger, 1893)	subtropical	Intermediate	7	1	4	7	2	1
<i>Globorotalia crassaformis</i> (Galloway & Wissler, 1927)	subtropical	Deep	4	2	3	3	3	2
<i>Globorotalia globorotaloidea</i> (Colom, 1954)	subtropical	Deep			1			
<i>Globorotalia hirsuta</i> (d'Orbigny, 1839)	subtropical	Deep	15	8	8	10	9	8
<i>Globorotalia truncatulinoides</i> (d'Orbigny, 1839)	subtropical	Deep	42	24	16	35	7	34
<i>Globigerinella calida</i> (Parker, 1962)	transitional	Intermediate	1	2	2	1	2	2
<i>Globorotalia inflata</i> (d'Orbigny, 1839)	transitional	Deep	12	19	27	19	19	28
<i>Globigerina bulloides</i> d'Orbigny, 1826	cold	Intermediate		7	7	1	19	3
<i>Globigerina obesa</i> (Bolli, 1957)	cold	Intermediate		1	1		1	
<i>Neogloboquadrina pachyderma</i> (Ehrenberg, 1861)	cold	Deep		2	1		7	

Concluding remarks

- The foraminiferal assemblage reflects the occurrence of water masses with different climatic signature
- The influence of the Mediterranean Outflow Water is inferred from the presence of abundant sinistral forms of *Globorotalia inflata*, a transitional species that dominates the planktonic assemblage in the Mediterranean Sea.

GMV is funded by the Spanish Ministerio de Economía y Competitividad Project CGL2014-52096-P. We also acknowledge Javier Urrea, Ángel Mateo-Ramírez, Jose Luis Rueda and Marina Gallardo for the sediment sampling and processing during the cruise.

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 678760 (ATLAS). This output reflects only the author's view and the European Union cannot be held responsible for any use that may be made of the information contained therein.