Mediterranean - Oct. 1988

Ship: "Garcia del Sed" Science Crew:

U.S.A.
* Ken Rinehart - Illinois
Bob Hughs - Buffalo
* Rick Brosca - San Diego

Nat'l C.S.I.C. (Blanes)
* Enrique Ballesteros ("kike") (PhD) (algae)
* Francisco Javier Turon ("Xavier") (PhD) (ascidians)
* Maria Dolores Rosell ("Dolores")
* José Maria Tur (PhD) (cnidarians)
* Maria Jesus Uriz ("Josune") (PhD) (sponges)

PharmaMar S.A. (Madrid)
Rosario Guinea (chava)
Miguel Echenique (Director Gene
Andrés Gomez (Director of Operati
Marta Garcia
Cristina Acebal

PharmaMar Board of Dire
(1) Jose Maria Fernandez
(2) Jose Luis Fernandez
(The Fernandez cousins are the family that owns much of ~~commercial network~~, i.e. pharmaceuticals, fishing fleets, Pescama
(3) Ken Rinehart - U. of Illinoi
(4) Charles Jefford - Univ. o
(5) Pedro Fernandez (Jose Maria

*=divers

C.S.I.C. = Consejo Superior de Investigaciones Cientificos (under the Ministerio de Educacion y ciencias). CSIC has sever units, called "centers", including the Centro de Estudios Avanza de Blanes" & the "Instituto Ciencias del Mar" (in Barcelona).

Planned Itinerary, Expedicion PharmaMar I

note: somewhat altered en route

10/3: Depart Barcelona (eve)
10/4 - 10/6: Islas Columbretes
10/7: Isla Dragonera. eve - steam to Palma de Mallorca
10/8 - 10/10: Islas Mallorca & Ibiza
10/11 - 10/13: Isla de Cabrera
10/14 - 10/17: Isla Menorca
10/17: steam for Barcelona (eve)
10/18: disembark

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* = obtain for library

note: Prime fare at the Barcelona mariscos restaurants is Nephrops norvegicus (Reptantia, Astacura), the "Norway lobster" or [in Spain] "Langostino". The meat is very sweet, like Macrobrachium meat. Also popular is Panulirus vulgaris (Retantia, Palinura), the "spiny lobster" or "Llagosta" in Spain. Prices have gone sky-high in Spain over the past 3 years (since I was last here), due largely to Spain joining the European Common Market. This, combined with the devalued U.S. dollar, makes Spain a very expensive place (like London was 4-5 years ago). Dinners run $35-50 per person at average restaurants!

Lab assays to be done on this expedition: anti-viral (Herpes simplex-HI horse virus), cytotoxin (rat tumor cell line), antibacterial (several strains), anti-fungus (Aspergillus), anti-yeast (Candida).

virology. { Bob Hughes (Robert G. Hughes, Jr.) (& Kay)
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Note: all localities in Gulf of Valencia, Mediterranean Sea, off coast of Spain. All stations are scuba collections by Brusca, Rinehart, et al.

10/4/88 STATION #1. Columbretes Is., Columbrete Grande 70'-100'. (39° 53.6' N, 0° 40.9' E) - west side of Island.

Myriozoum truncatum (= Myriapora truncata) - bryozoa (coral)
Paracentrotus lividus - rock urchin
Holothuria (poli?) - brown cucumber
Haliotis lamellosa - abalone (= H. tuberculata)
Cladocora caespitosa - true coral
Codium bursa - 2" green hemispheres
many sponges (rich area for sponges), some massive encrusting tunicates. Invial crustaceans taken.
Halimeda tuna - ¼"-⅜" wide, pale green joints
Udotea

10/4/88 Station #2. Columbretes Is., Columbrete Grande, 80' dive in central crater.

Echinaster sepositus
Arbacia lixula
Paracentrotus lividus
Sphaerechinus granularis (not always dark w/white tipped spines)
Halocynthia papillosa
Murex trunculus (= Trunculariopsis trunculus)
Thais sp?
Anemonia sulcata
Bonellia viridus
Peltodoris atromaculata - nudibranch (white, blk spots)
many sponges
Balanophyllia europa (cup coral)
Cladocora caespitosa

(6)

10/5/88 Station #3. N Columbretes Is., "Placer de la Barra Alta" (submerged reef 10-30 m). Dive at 30m (~95'). (0° 32' E, 39° 49.7' N)
Dive routine: 95' for 30 min., decom @ 20' for 5 mi
decom @ 10' for 2 min. Total dive time = 37 mi
Small Crustacean sample taken.
Many sponges & algae
Astraea rugosa
Sertella (beaniana?) - cristate bryozoan
Myriapora truncata
Phallusia (fumigata?) - green ascidean
Leptosammia pruvoti - yellow-orange solitary coral (polyps grouped at base ofte
Madracis pharensis - thickly encrusting "star" coral

KEY TO CORALS OF COAST OF SPAIN (Gila, I. Sarda, 1986)

1. Wall of polyp cup perforated 2
- " " " not-perforated 4
2. strictly solitary ..... Balanophyllia (B. europa & B. regia)
- Colonial, or forming groups of Polyps 3
3. Colony large & branching; 2nd ary septa united in the form of triangles; columella reduced .... Dendrophyllia corni
- Colony with only a few individual polyps; 2nd ary septa united as triangles (as triangular pares); columella short; yel orange..... Leptosammia pruvoti
4. Polyps without central columella 5
- Polyps with central columella 6

5. Monomyces pygmaea, Thalamophyllia gasti, Desmophyllu
cristagalli

6. Columella small or reduced, without paleos 7
- Columella well-developed, with paleos 8

7. Guynia annulata, Madrepora oculata, Madracis pharen
Hoplangia durotrix

8. - Columella formed of twisted lamellae & similar to pale
- " " " erect staffs/sticks & twisted

9 ~~8~~ Always solitary; 2nd arg & 3° rysepta equal .... Caryophyllia smithi
- Solitary or colonial; " " " unequal... Phyllangia moucherii,
Caryophyllia inorn

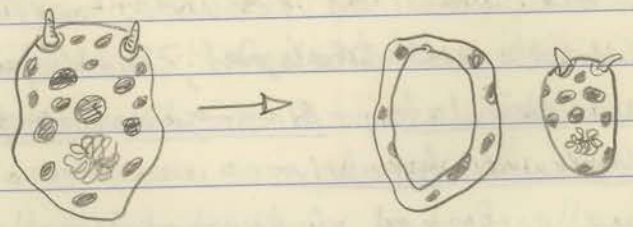
10 ~~9~~ Paracyathus pulchellus, Cladocora
caespitosa, Polycyathus muellerae

10/5/88 Station #4. Golfo de Valencia (Spain), Columbretes Is.,
Islote La Horadada / Islote Lobo. 60' dive in
channel between these 2 islets (the channel is actually
the pit of an extinct volcano; the 2 islets are 2 side
of the volcanoes rim). Beautiful seascapes. Hose
on my regulator blew out at 40' - borrowed Jose
Maria's spare regulator to finish dive!
0°40.2'E, 39°52.5'N

A gorgeous dive in the crater of an extinct volcanoe.
The water was filled with colonial salps that appeared
as donuts, or discs, hooked together side-by-side, up to
1½" long (Salpa democratica Forskal?).

A specimen of the nudibranch Peltodoris atromaculata
Bergh was taken, and when sorting on deck, in a
pan of water, it cast off its outer mantle, as a

ring. I have never seen (or read about) a nudibranch doing such a thing!



Other animals take include:
Pinna squamosa (a protected species in Spain)
Bonellia viridus - an echiuran
Pava centrotus lividus - obviously very common in the region (the S. franciscanus of the Med)
Clavelina nana, Myriapora truncata,
Two crabs taken for SDNHM. Also a pair of shrimp from Pinna squamosa (= P. nobilis): Pontonia pinnophylax (Otto)?

10/6/88 Station #5. Columbrete Grande. Return to lee side of largest island in Columbrete group (which is only about 300 M long) for morning dive, to avoid high winds and large surf. Waves are crashing over gunnels & the stern, but Ken feels it is safe to dive. I disagree & opt out. Diving regulations are essentially non-existant on this ship, & there is no assigned dive officer (every man for himself). Seas are very rough today; it will be a killer 8-12 Hr steam to Majorca this afternoon!

39°48'N
0°32'E

Two samples taken for SDNHM: (1) vial of small crustaceans, inc. algae carrying drowiid, (2) large sponge

10/7/88 Station #6. Spain, Baleares Islands (Med.), Islote Dragonera, off E. coast of Isla Mallorca. 100' dive off so. end of Dragonera, ~39° 34.5' N 2° 18' E. Another great Rinehart dive story - Ken discovers a cave & goes off all on his own w/o telling his dive buddies where he is going. We search for him for 30 min before he reappears! Decom by tables.

Afternoon & eve in Palma, Majorca. The ladies took the gentlemen to "Abaca" tonite; beyond description! Excellente. Ran into Charles Jeffrei & the Fernandez cousins at Abaca; they will rendevous with our ship tomorrow afternoon to "watch the operation" from a chartered yacht.

10/8/88 Station #7. Spain, Baleares Is., Isla Cabrera, Cueva Azul. Dive in Cueva Azul on coast of island (marine can) (~39°9.9' N 2° 56.9' E).

Blue cave is ~300' deep, grotto-like. Aside from the littoral band, the submerged walls of the cave are relatively barren. Some Arbacia and a couple kinds of scattered sponges. Upside-down jellyfish were being washed into the cave from the open sea (Cotylorhiza tuberculata Agassiz) each with population of small fish. I was stung on the arms & face by one, but the welts were minor & lasted only a couple hours. Another dromiid was taken by Ken (for SDSU HM) - Dromia personata (L.) [= D. vulgaris]. Jo Jone collected a hermit for me, outside the cave in 30'-40' (Dardanus calidus Risso).

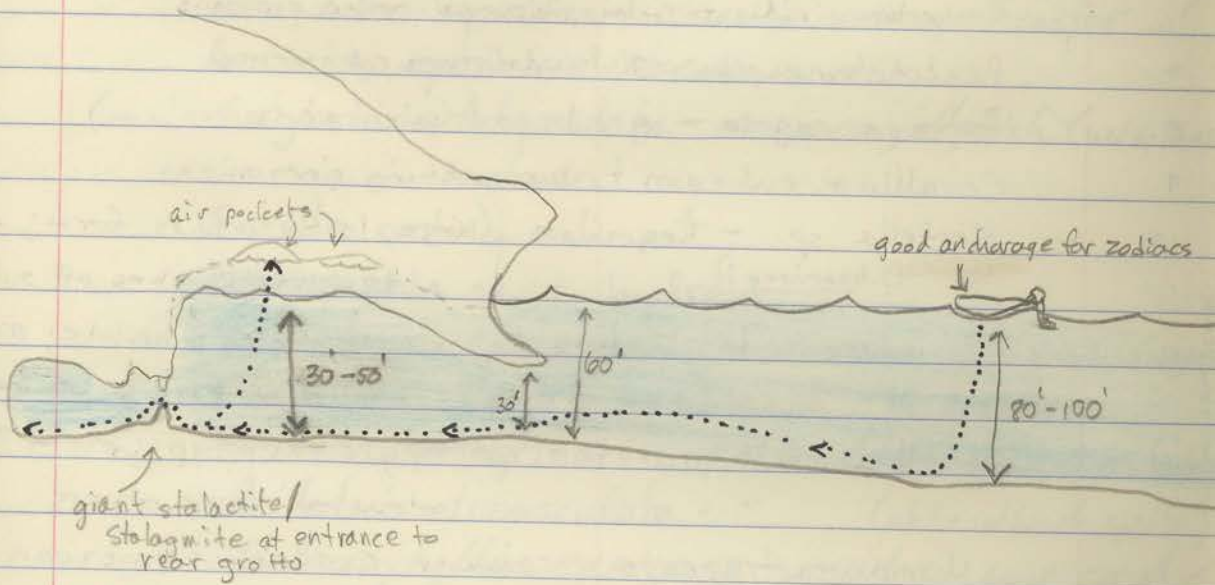
This sample lacks an internal label - #7 written on bag

10/8/88 Station #8. Same locality as #7 (Blue Cave). Dive made in cave with entire dive crew, plus Jose Maria Fernandez and his wife. A bit of a circus as we have to tow one of the zodiacs with

the other (El motor nosirve). Also, we are being visited this weekend by some Pharmamar directors (on a very nice 60' yacht), so organizatio is confused at best, absent at worst. Arrived at cave entrance 30 min. before sunset, and of course had to find our way back to the ship in the pitch dark (bad move!). Some of the Spanis divers knew the cave well and took us through an underground hole to a second, deeper cave that is not visible from sea. We penetrated 100' or so into it (how deep it is I have no idea, at least 300' or so Several trapped air pockets exist (quite large) with good air. I think the entire cave could be penetrated at H_2O depths no greater than 20'. Tonight a fiesta (again). Lunch was a fiesta also, wi Sangre de Toro vino (blanc seca y tinto), fish soup, steak, flan, anchovy salad, etc etc. Tonite is BBQ cuttlefish, Spanish sausage, & steak, with tossed gree salad, sangria, and Irish coffee (w/ coffee ice cream in it) for dessert. Fantastic meal. Niel Girrard flies to Nice tomorrow morning, but Charles & the Fernand brothers join us for another afternoon dive on Sunday Charles is OK. Niel I'm not sure about. Niel wants me to visit him on way through London, where he will return on the 10th. I suspect he merely wants to pump me for info on PharmaMar, which he is thinking of dumping some venture capital into. (He should talk to the Fernandez cousins, who probably lost millions in the SeaPharm fiasco).

10/9/88 Station #9. Islotes Estels (so. of Isla de Cabrera), Estel des Dos Colls. 3°56.2' E 39° 7.4' N.
Plan was to penetrate tunnel at 40' that goes from one side of island through to other side. Ken had trouble clearing his right ear, so other divers went ahead to tunnel while I stayed with Ken. He finally cleared, & he & I made 90' descent to collect along wall & on bottom. Decomp: 5 min @ 30', 5 min @ 20', 2 min. at 10'. Very strong currents (1-2 m/sec), combined w/ head cold, foreign regulator (mine broken) & uncomfortable double tanks, plus my new B.C. now has a broken air valve, plus I must carry a depth guage in my dive bag (hard to see) all combine to make for uncomfortable diving. I must acquire: wrist depth guage, new strap for compass, spare regulator hoses, new mask with large schnozola chamber, B.C. with inflation valve, dive bag w/rope mouth.
Beautiful dive despite hassles - 100' visibility, many fishes, clear blue water, some new animals. We now wait for the Pharmamar yacht to return to spend the rest of day with us. Lunch was once again incredible: crab salad, fish canole, steak & fresh vegetables, and of course, much wine. A wonderful spanish casaba-like melon for desert.
*Note: Ken's 60th B-day is in March ('89). Ken is talking retirement, though I find it hard to believe, unless PharmaMar puts him on a retainer. Too bad streptomycin (which he discoved) isn't used much anymore - he could retire on the income from it!

10/9/88 **Station #10** Spain, Baleares Islands, Isla de Cabrera
So. side of island, Calamares Cove. 3°56.4° E 39°7.8'
Dive into "Calamare cave". Bottom depth at entrance
~ 50', inside cave 30'-50'. Exquisite, stalactites &
stalagmites, air pockets, vast grotto with smaller
"rooms". Too much. (and me without a light!!).



Collections made throughout cave, mostly sponges.
large crab seen but not taken (too large). As
usual, Ken & I were the only people collecting.
Jose Maria & his wife (Monserratte = "Monse" :)) were
with us again, so it was largely a fun dive to
impress the **jefe**. Overall, caves do not seem to
have a rich fauna, no doubt do to absence of
sunlight, and harbor mainly a select poriferan
fauna (suspension feeders). Ken & I pushed the repetitive
dive table pretty hard on this dive, as we had not expected
the cave to be at such a depth. Decom for 7 min at 20'.

NON-SPONGE INVERTS COLLECTED IN BALLARDS (pp. 14, 15, 18, 25)

1. ✓ Truncolariopsis trunculus - gastropod (= Murex trunculus)
2. Aplysia sp. - sea hare
3. Diplosoma sp. - compound ascidian
4. ✓ clavellina nana - solitary ascidians (clumped at bases)
5. (sp?) Aplidium tabargriensis - compound ascidean
6. ✓ Bonellia viridis - Echiuran w/ forked probosis
7. Pseudodistoma sp. & Pseudodistoma cyrnusense
8. ✓ Astraea rugosa - gastropod (calcareous operculum)
9. Corallium rubrum - encrusting gorgonian
10. ✓ Sertella sp. - bryozoan (large, leafy, porous form; erect to several inches off substrat (S. beaniana?)
11. ✓ Ophioderma longicaudum - common brown brittle; arms may or may not be banded.
12. ✓ Leptosammia pruvoti - solitary coral polyps; every 3rd sep elevated above others
13. ✓ Myriapora truncata - common corallacious bryozoan (photo graphed).
14. Ophidiaster ophidianus - common large purple seastar (photographed); arm tips curl up.
15. Marthasterias glacialis - uncommon warty variegated seastar (yellow-brown w/green high
16. ✓ Arbacia lixula - common dark purple sea urchin. Peri very large, covers nearly entire oral su
17. Aiptasia mutabilis - anemone (bluish; solitary; small)
18. ✓ Haliotus lamellosa - small abalone
19. ✓ Anemonia sulcata - common anemone (tentacles g w/purple tips)
20. Maia verrucosa - "sheepshead crab"
21. Antedon mediterranea - purplish-brown crinoid

good anti-fungal activity

note: this bryozoan shows strong anti-viral activity, also is cytotoxic. It is not, however, active anti-fungal or anti-bacterial.

22. ✓ Parazoanthus axinellae - common orange solitary cora
(joined at base often)
23. Holothuria forskali - cucumber (black body w/ white
protuberences [tubefeet?] all over body).
24. Lepidonotes clava - polychaete
25. Astraea rugosa - gastropod (= Turbo rugosus)
26. ✓ Echinaster sepositus - common orange seastar
27 Actinia equina - anemone
28. Cotylorhiza tuberculata - common jellyfish (w/ fishes
tentacles).
29 Patella rustica - limpet
30. Aglaophenia sp. - hydroid
31. Eudendrium sp. - hydroid (brown branches, pale pinkish-orange p
32 Flabellina affinis - nudibranch (all lavender)
33 Cratena peregrina - " (white w/ purple tentacles
34. ✓ Peltodoris atromaculata - " (white w/ black spots)
35 Balanophyllia europaea - solitary cup coral;
yellow; often compressed in center
36 Cerianthus (C. solitares ?) - cerianthid anemone;
uniform dark chocolate brown; tentac
not banded.
37 ✓ Sabella pavonina - sabellid (chitinous tube); banded
brown tentacles
38 Didemnum sp. (6-X-89-1-27) - about 3 unidentified species
39 Schizoporella sp. (leafy, encrusting, semi-erect watersipora
bryozoan)
40 Frondipora verrucosa - bryozoan; grows as thick
knotty stringers encrusting rock (resembles miniat
kelp holdfast)
41 ✓ Phallusia fumigata - styela-like solitary tunicate.
42 Ascidia mentula - " " " "

10/10/88 Station #11. Baleares Islands, Isla Cabrera, E. side (ha Olla area). ~39°9.1'N 3°57.8'E. 10'-20' dive in lagoon with sea grass beds (Posidonia) and rocks. Crustacean sample taken (in 3 vials), including crabs, hermits, & porcel

The famous Mediterranean Posidonia beds are pretty boring really, altho where they meet rocks the faunal & floral diversity goes up.

Altho the food on this vessel is outstanding, I must say Spanish sailors have a different view of cleanlines than American sailors - this ship is rather fucking filthy.

10/11/88 Station #12. Isla Menorca, No. side, Cabo Cabelleria ~4°5' E 40°6' N. Dive below light house point. 80' dive, decom 10 min at 20'. One hermit crab taken @ 80'.

I am struck by the differences in decompression time between the British tables and the U.S. (Navy) tables. At 80' the British t indicate (for 30 min.): 5 min @ 20', 2 min @ 10'; the U.S. tables: no decom at all. At 80' for 40 min, the British = 5 min @ 30', 15 min @ 20', 2 min @ 10'; the U.S. no decom at all!

10/11/88 Station #13 Isla Menorca, No. side, dive inside channel of Fornells. 4°8' E 40°4' N shallow dive, 2m - shore, in seagrass beds & rocks. Saw 2 octopuses, each with a body 12" across! Also watched a cuttlefish swimm & resting on the bottom for a while. And, as in other locals, very large moray eels.

moray = Muraena helena (?)

Octopus = O. macropus (?) or O. vulgaris

note: there are at least 8 species of cuttlefish (Sepiidae & Sepiidae) in the Mediterranean, in at least 4 genera.!
→ shrimp & hermits taken for SDNHM.

Water temp. until today has been averaging ~23°C (ship hull reading). Today, in Menorca, it has been ~20°-21° C, just enough of a drop that I have gotten quite chilled diving. Hence, ~20°C must be my comfort zone cut-off point. No more trips to places colder than 22°-23°C (interestingly, this is the same temperature limit as coral reefs, as noted by Darwin, and later Dana).

The contrast between Spanish & U.S. ship safety proceedures is striking. Virtually anything goes on this ship. Diving is not regulated or monitored at all. The zodiacs, only one with a motor (which often refuses to start), the other which must be towed everywhere, routinely work out of sight of the main ship. There are no C.B. radios or flairs in the zodiacs. If we had problems, we could not contact the "Garicid". To make matters even more risky, Andres usually doesn't like to wait in the zodiac for us to complete a dive, hence often cruises around (or back to the ship) in the one zodiac with a motor, leaving the motor-less zodiac behind. Hence, if we had a diving accident there would be no one around, no way to contact any one, and no way to go anywhere!

A northerly is moving in from the continent tonight, so we will steam SW in the hopes of escaping the worst of it.

(cont. from p. 15)

43. Arca noae - bivalve; common in crevaces
44. Parerythropodium coralloides - encrusting (on gorgonians) alcyonarian
45. Lepidonotus sp. - polychaete
46. Thais haemastoma - gastropod
47. ✓ Halocynthia papillosa - large, contractile, solitary tunicate
48. Eunicella singularis - white stalked gorgonian (brown polyps
49. ✓ Paracentrotus lividus - urchin
50. Halecium (H. tenellum?) - fragile hydroid w/ large pink polyps
51. Hypselodoris elegans - nudibranch; large (several inches), whitish-clear body w/ colored longitudinal stripes [photographed]
52. Alicia mirabilis - anemone; typical Alicia-like (bubbly) form
53. Aplidium conicum - compand ascidean
54. Calliostoma sp.
55. Porella cervicornis - Bryozoan (delicate myiapora-like form)
56. Holothuria sp.?
57. ✓ Sphaerechinus granularis - large, symmetrical, purple-spined urchin; spines very short, w/ or w/o white tips)
58. Holothuria tubulosa - cucumber
59. Schizomanella mamillaris - orange encrusting bryozoan
60 Hacelia attenuata (uncommon, deep-water pale orange anemone)
61. ✓ Holothuria polii - cucumber
62. Holothuria tubulosa - "
63. Zoobothryon verticillatum (= Z. pellucidum) - Spagetti bryo
64. Schizoporella errata - ?
65. Ecteinascidia turbinata - communal, ciona-like ascidean
66. Eudendrium racemosum - hydroid
67. Paramuricea chamaeleon - large purple gorgonian
68. Dardanus calidus - lg. red hermit crab
69. misc unidentified bryozoans (at least 3 species).

10/12/88 Station #14. Mallorca Is., No. end @ Cabo Formentor. Dive directly under lighthouse, at tip of cape. 120' dive - at 100' we encountered a tunnel ~30' long. Collections made at depth & throughout tunnel, but not much new to see. Visibility ~80'-100'. H_2O T° back up to ~23°C.

Rough dive this morning. Rough seas, cloudy & overcast, cold, wet suit soaking wet & chilled from being on deck all night. Even though it was beautiful under water, these early morning dives every day are getting to be a pain in the ass.

Unlike the Columbretes (a national park reserve), which are recent volcanic islands, basaltic, rugged, and with almost no vegetation yet, the Baleares are largely weathered limestone. The various past sea level stands (ancient shorelines) are clearly visible and at each level there are many caves. The entirety of each of the Baleares islands is cavernicol and the coast is just one cave after another, bo at the present water level, and below, at 30', 40', and 100' it seems. The interior of the islands must also have caves, perhaps archiali or with freshwater.

10/12/88 Station #15. Mallorca Is., Puerto de Alcudia. Dive on Islote de Aucanada, off of Pta. de Aucana ~39°50.21N 3°10.3'E. 50' dive into cave on small island; small cave, but interesting.

Ken departs tomorrow for Madrid (by taxi from Alcudia to Palma & by air to Madrid), to meet with PharmaMar Board of Directors on Friday.

Evening in port, in Alcudia. A charming Spanish village. To a small pub recommended by locals for Sangria & tapas. Andres orders tapas for the Cpt. & entire science crew (12), -- 2 kinds of shrimp, baby octopus, squid, 2 kinds of fish, spiced pickled peppers, & "french" bread. The Sangria was a killer. Fine night in town. Tomorrow we steam for Isla Ibiza. Bob & I toast Ken farewell (Fair winds & Far Places), and he toasts us (Until we meet again). Who knows where that might be. (Perhaps the Canary Islands in '89?)

10/13/88 Station #16. El Farayó, just So. of Cabo del Freu, Mallarca I. ~ 3° 27.5' E 39° 42.5' N. Circumnavigate small islote at ~30', at El Farayó. Entire island is penetrated by caves & tunnels that allow ~~one~~ one to swim through the island, from one side to another (30'-80' across). I penetrated some shorter ones, but avoided the deeper darker ones & the ones that had only a few feet clearance. Ken was kind enough to leave his dive light with me for the remainder of the trip. Another early morning dive, overcast, drizzling, ice-cold clammy wet suit. European scuba tanks are also a drag. They weigh twice as much as U.S. singles (very difficult to carry), and have a crappy back-pack arrangement, such that I am constantly, throughout a dive, pulling my shoulder straps back up

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off my arms. The whole scene is very cumbersome, cold, & uncomfortable. Good thing the scenery underwater is magnificent, or it wouldn't be worth it. I only wish Ken, in his usual style, had thought to inform me that we would be doing cave diving!

Nothing new to collect on this dive. I think we've pretty much exhausted the Balearics of its species diversity.

10/13/88 Station #17. Cabo del Freu / Pta. na Foguera, just nor of El Farayó, on Mallorca Is. I opted out of this div need to warm my bones. Others went to "The Cathedra a well-known, large, underwater cave. Cave diving is fun, but does not produce many samples! The spanish divers are not good collectors either; none ever return with their bag stuffed. There is a lot of "pleasure diving" going on on this expedition!

10/14/88 Station #18. Mallorca Islands, Isla de Ibiza, w. side of island at Islote Bleda Plana group. Dive along vertical wall of Islote Redonda del W. ~38°59' 1°10'E. Plan was to go directly to bottom (160') and then work up vertical wall to surface. Extreme thermoc at 100' kept Brusca above that depth (Kike & Xavier wen all the way down). This thermodine was the 1st of the trip and was the most marked I have ever experienced. Estimated drop was from 23°C to 16°C within 12"! Cra taken at 80' for SDNHM.

10/14/88 Station #19. Isla de Ibiza, so. end of island, on No. peninsula of Isla Formentera, bay between Pta. Pedreras & Islote Sabina, ~1°26'E 38°44'N. Snorkel trip in shallow bay, 1-3 m deep, to collect ascideans in mud. Very cold water, very dirty water, visibility 0', totally stupid dive. We got the ascideans though.

("Estuary dest'n")

Eoteinascidea turbinata ←

Evening in the small town of Ibiza (=Eviza). An absolutely wonderful Spanish vacation village, with a few too many teen-agers for my taste, but overall extraordinarily charming. Architecture old & rather French, wrought iron, narrow streets paved with stones & bricks, many expatriots, Africans, French, very few Americans, fantastic seafood & nightlife, wonderful casino. Ibiza is a place to return.

10/15/88 Station #20. Isla de Ibiza, Islote te Vedra. ~38°52'N 1°12'E. Dive down sheer vertical wall of Vedra island. Thermocline encountered at ~120'-130'. Brusca worked the thermocline depth, Xavier & Kike went to ~160', Dolores & Josune worked ~70'. Not much new, though a beautiful dive. Crabs taken for SONHM (80'-130' depth range).

Getting to station was very rough, heading into large swells, the ship rolling & pitching so much the whole lab was practically destroyed. So was my back when a big roll pitched me against the bulkhead & rammed a bolt head into my lumbar vertebrae. This entire trip has been plagued by rough seas.

10/15/88 Station #21. Somewhere near Formentera (Isla Ibiza). 70' dive. Discovered tunel; swam through (~20') from one side of small peninsula to other. Many Bonellia viridis probosces collected. Dive 19 in 12 days; even with the warmer water here, good visibility, beautiful seascapes, diving is becomming a drag. Just 3 dives to go, then we steam for Barcelona.

10/16/88 Station #22. Somewhere on Formentera Is., off Isla Ibiza. I opt out of this dive. Woke up with headache, as did several others. Crew claims it is due to dry dusty southerly winds that are now blowing across the region, carrying sand from the Sahara. The southerlies are mixing with the tail end of the northerly (from last week's storm) to create very choppy seas and mixed swells. Lousy weather continues. August/Sept. are apparently the best months to visit the Med.

10/16/88 Station #23. Somewhere on a rough point of land outside San Antonio, Isla Ibiza. The southerly has really kicked up. We have 10' swell chops, a dark sky & drizzles. Having skipped the morning dive, I feel guilty & make the afternoon dive. Everyone but Jose Maria (who runs a dive shop), Kike, & me back out of the dive. We dropped down a sheer wall to 110', worked for 20 min., then worked our way slowly, stopping at 60'

30', and 20' for decompression (~ 10 min. each). Surge was almost too strong to work, even as deep as 30'. By the time we surfaced the weather was even worse. Dark & forbidding. The cliffs near our zodiac were pocketed with caves, tunnels & holes. The waves surged into them, some blasting out gieser-like sprays of foam as blowholes, and as the water rushed out air was sucked in so fast it made a loud jet-engine like noise. Some of the holes are very very deep and I suspect a swimmer venturing too near would simply be sucked in, stuck in the tunnel somewhere along the way, & crushed or drowned in seconds. Diving this close to such areas in stong storm seas is crazy. There is no way the skipper of an American ship would allow some of this stuff we do.

We will now beat a fast track to San Antonio, for safe anchorage for the night, hoping this African storm passes quickly. It's so strange to be at sea, in gale winds, with high storm seas, yet have the wind be warm, almost like a So. Calif Santa Ana. You can almost smell the sands of the Sahara in the air.

In port in San Antonio for the night. A miniature version of Ibiza - not as nice. So many beautiful women though!

(cont. from p. 18)

70. Coscinasterias tenuispina - Sea star (resembles Gulf species - Echinaster tenuispina ??)
71. Nemertesia cf. ramosa - hydroid
72. Phallusia mammilata - tunicate (solitary)
73. Didemnum commune - "
74. Rhopalaea neapolitana - " (solitary; connected by sto
75. Sertularella sp. - hydroid
76. Didnyum elegans - tunicate
77 Ophiura texturata - small brittle star
78. Astropecten aurantiacus - sea star
79. Cereus pedunculatus - anemone (=Heliactis bell
80. Calliactis parasitica - hermit crab anemone
81. Dictyonella sp. - ?
82. Schizomamnella mammillata
83. Hoplangia sp.
84. Caryophyllia sp.
85. Alcyonium acamle (sp.)

10/17/88 Station #24. Isla Ibiza, outside San Antonio harbor. Last dive of expedition, on small islote (actually a rock) about a mile offshore. Rock is vertical-sided, straight down to 130'. Surge & currents very strong. Entire dive team participated in this last dive (6 people).

Lunch was special, even with fresh baked pastries and champaigne. We set steam for the coast of Valencia after lunch. The deck and all equipment are covered with a fine brown powder of sahara sand & silt. The winds have calmed but the sea remains rough, with 5' swells. It will be a long rough 18 hr. steam to Barcelona.

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NON-SPONGE INVERTS COLLECTED IN COLUMBRETES. (36 spp.)

✓ Truncolariopsis trunculus - gastropod
✓ Haliotus lamellosa - abalone
✓ Peltodoris atromaculata - common white/blk spotted nudibranch
Maasella edwardsi - small, multi-polyp clusters, soft coral
Cladocora cespitosa - highly branched "finger" coral
✓ Anemonia sulcata - large anemone (grn tentacles w/purple tips)
✓ Echinaster sepositus - common orange sea star
✓ Arbacia lixula - urchin
✓ Holothuria poli (?) - cucumber
✓ Paracentrotus lividus - common urchin
✓ Sphaerechinus granularis - urchin; purple, lg., short spines
✓ Halocynthia papillosa - common, lg., contractile, solitary tunicate
Aplidium nordmanni ? - ascidian
✓ Bonellia viridus - echiuran
Cenocyathus sp. - anthozoan
✓ Parazoanthus axinellae - yellow cup coral; polyps fused basally
Schizomanella sp. ? (sp?) - bryozoan
✓ Astraea regosa - gastropod (calcareous operculum)
Ostraea sp. - oyster
✓ Phallusia fumigata - solitary tunicate
✓ Myriapora truncata - common branching coral-like bryozoan
✓ Sertularia sp. - hydroid
✓ Leptosammia pruvoti - solitary coral polyps (or semi-colonial) w/elevated septa (every 3rd septum)
Madracis pharensis (sp?) - true coral
Pseudodistoma cruigaster (sp?) - tunicate
undetermined opisthobranch.
✓ Clavellina nana - compound tunicate (semi-compound)
✓ Ophioderma longicauda - common brown brittle star
✓ Coscinasterias tenuispina - sea star (resemble Gulf species: ?)

(36 spp.)

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✓ Sertella (S. beaneana ?) - bryozoan
Hippodiplosia (H. fascialis ?) (H. foliacea ?) - bryozoan
✓ Sabella pavonina - sabellid worm
Didemnum sp. #1
Hoplangia durotrix - coral
Phyllangia mouchezii - "
✓ Caryophyllia sp. - " (solitary polyps)