

PharmaMar Mediterranean Expedition V, 9/13/92 - 9/26/92

Jefe de la expedición: Andres Gomez

Taxonomists/divers: R.C. Brusca, PhD (SDNHM)

Just Bayle, PhD (Univ. Alicante) - fishes

H. Bulnet Kukurtzu (PharmaMar) (Turk)

Judy Connor, PhD (MBARI) - algae

Andres Gomez, PhD (PharmaMar)

Karen Green - Sponges

José Antonio Moya - photography

Dianne Tapiolas, PhD (PharmaMar) (Aust.)

Eduardo Vega, PhD (PharmaMar)

Regina Wetzler (SDNHM)

Aurelio (Univ. Alicante) - Algae

Biochemists: Cristina Azebal, PhD

Fernando de la Calle

Ada Cañedo, PhD

Fernando Espliego

Pilar Rodríguez, PhD

Serafin Rodríguez

Maintenance: José María Moreno

Gregorio Paniagua

Others: Carlos Benito, Director

SDAN (Sociedad para el Desarrollo de
Actividades en la Naturaleza)

Velázquez 94-2º izda.

28006 Madrid

(91) 435-25-62-577-09-60

Planned itinerary

- 9/13: Drive to Castellana de la Plana
- 9/14 - 9/18: Columbretes Is. (Reserva Marina)
- 9/19 - 9/20: Drive to
(exchange personnel)
- 9/21: Isla de Tabarca (Reserva Marina)
- 9/22 - 9/23: Islas Hormigas
- 9/24 - 9/25: Cabo Tiñoso
- 9/26: Return to Madrid

TARGET SPECIES

- Tunicates
- ✓ Aplidium albicans
 - ✓ "Distaplia sp." (= Aplidium albicans deepwater morph, w/o arrowhead)
 - "Botrylloides sp." (= Pseudodistoma sp.) (? Pseudodistoma sp. collected on this '92 expedi.)
 - Clavelina nana
 - Polysyncrator sp. (P. rosa?) - Canaries Is.
 - ✓ Sidngum sp. (S. turbinatum collected on this [192] expedi.)

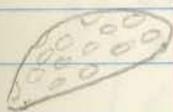
- Balanophyllia europa - solitary coral
- Berthella aurantiaca - Apricot slug
- ✓ Peltodoris atromaculata - white slug (w/black spots)
- Bugula neritina - bryozoan
- Concinasterias tenuispina - blue multi-armed seastar
- ✓ Sphaerechinus granularis - Common purple urchin
- ✓ Margaretta cereoides - yellow-brown Bugula-like bryozoan

- Sponges
- ✓ Clathrina sp. - yellow lacy sponge
 - ✓ Hamigera hamigera - Blood-red papillate sponge
 - Scopalina lophyropoda - sponge (Canaries)

TARGET SPECIES (cont.)

- Plants {
- Cladophora sp. - green, filamentous alga
 - Zanardinia prototypus - encrusting brown alga
 - Cymodocea nodosa - sea grass

TAXONOMIC CHANGES (per Françoise Monniot) (viz. Javier Turon)



- (1) Botryloides sp. B (of '91 Exped) = Pseudodistoma (P. crucigaster?)

Outer tunic smoky black with abundant lighter-colored surface pits; inner tunic light gray; zooids white w/ orange endostyle.



- (2) Distaplia sp. ? (of '91 Exped) = Aplidium albicans. Tunic light amber-yellow; zooids pale orange, scattered; 1-4 cm tall flat-topped lobes; deep (>100').

NOTES ON "APLIDIUM"

(based on P-388 + A-549 anti-tumor activity)

Active forms

Active forms: stalked, zooids visible
oblong, " "

Inactive forms: Encrusting or w/o visible zooids
(i.e. solid orange, white, milky)

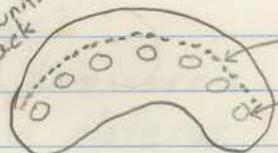
14 September 1992 [note: All work for this Expedition is on coast of Murcia Province, Costa Azahar & Costa Blanca].
 Colambretes Islands. (staying in house in Burriana, SW of Castellón de la Plana)
 Dive #1. Banco de Don Jorge Juan. 3-50 m.
 39° 51.9' N 0° 40.3' E. H₂O T° = 70°F (below thermocline @ 60' = 62°F). Wetzer/Brusca/Gomez to 82' for 43 min.

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1. Spongia sp. A
2. Hamigera hamigera
3. Anchinoe tenacior
4. Geodiidae sp. A
5. Sphaerechinus granularis. Test globoid; spines white, or purple w/white tips (see urchin key).
6. Paracentrotus lividus, most common urchin on rocks, 0-100'.
7. Sphaerechinus granularis. Spines tan w/white tips.
8. Eudendrium rameum
9. Margaretta cereoides
10. Salpa sp. (Salpa maxima?)
11. Peltodoris atromaculata
12. Aglaophenia elongata } hydroids
13. Nemertesia antennina (in x-section)
14. ? Botryllus. Black kidney-shaped colonies, to 5 cm across; with white disc-like CaCO₃ spicules; zooids not evident (obscured by dark color).

similar to 17/9/91-10/92 ? Botryllus sp. A

NEW?

color uniformly black



x.s.

disc-like CaCO₃ spicules

chambers, lined with more spicules

15 September 1992

Columbretes Islands.

Dive #1. Brusca and Wetzer 100ft. / 45min. (Currents 2 knots)

Islote Navarrete, 3-30m. 39°55'N 0°40'E.

- 15/09/92-1001 *Aplysia depilans* (new)
1002 *Marthasterias glacialis*
1003 *Aplidium conicum*
1004 *Aplidium* ? *conicum* (zooids not visible)
1005 *Sertella beaniana*
1006 *Paracentrotus lividus*
1007 *Condylactis aurantiaca*
1008 *Margaretta cereoides*
1009 dorid nudibranch: apricot orange w/hard white bumps.
1010 *Peltodoris atromaculata*
1011 *Ascidia conchilega* (ascidian)
Green translucent tunic; yellow pharynx;
w/adhering sand.
1012 ? *Holothuria*. Dorsum tan w/numerous dark brown spots
(1-2 mm spots); ventrum creamy white with
sattered brown spots; 10"-12" long; distinct
sole (ventrum).
1013 (no sample)
1014 *Axinella damicornis*
1015 *Clathrina clathrus*
1016 *Cliona viridis*
1017 *Agelas oroides*
1018 *Halichondria* sp. B
1019 *Cacospongia scalaris*
1020 *Spongia* sp. A

Sponges

Dive #2. Brusca/Wetzar to 60ft./38min. Columbretes. La Horada
(entre Islote Méndez Núñez e Islote Lebe). 2-20m
39°53'N 0°41'E.

15/09/92-2001 Ophidiaster ophidianus

2002 Paracentrotus lividus. Common dark brown-green
urchin. Spines light colored, w/dark longitudinal
stripes, and encircled by white-patched fleshy
basal region; 3 spine sizes (small, medium, long);
longest spines to ~2cm max. length; largest
specimens ~6cm diameter; oral test opening
w/o notches or slits, ~50% test diameter.

2003 Aplidium conicum

~~2004~~ Caryophyllia (C. incarnata) (not saved)

2005 Peltodoris atromaculata

2006 Platydoris argo (see p. 298 in Poppe & Goto)

2007 Hexaplex trunculus

2008 Anemonia sulcata (= A. viridis)

~~2009~~ Eudendrium rameum

2004

2009/2010 (no samples)

sponges {
2011 Hamigera hamigera
2012 Axinella damicornis
2013 Oscarella lobularis

16 September 1992

Columbretes. Dive #1. Piedra Joaquín. 0-57m
38°53'N 0°40'E. Brusca and Wetzer 60ft./57m.

- 16.09.91
- 1-001 *Paracentrotus lividus* (2 bags)
- 1-002 *Sphaerechinus granularis* (2 bags)
- 1-003 *Ophidiaster ophidianus*
- 1-004 *Peltodoris atromaculata*
- 1-005 *Aplidium conicum* (vouchered)
- 1-006 *Aplidium* ? *conicum* (vouchered)
- 1-007 *Aplidium* sp. C (vouchered)
- 1-008 *Aplidium* sp. D (dead or dying specimen?) (vouchered)
- 1-009 *Echinaster sepositus*
- 1-010 *Margaretta cereoides*
- ? NEW 1-011 *Ophiomyxa pentagona*. Solid chocolate brown; disc pentagonal; disc ~2 cm diameter, arms ~10 cm. long; oral surface lighter (orangish); jaws with many teeth.
- 1-012 *Holothuria forskali*? Black above, brown below; white-blue tipped papillae.
- ? NEW 1-013 *Parazoanthus* sp. Colonial zoanthid; polyps 7-8 mm tall; orange column; tentacles yellow with orange tips; on rocks (not on sponge or other invertebrate); ~20 short tentacles. (vouchered)
- ? NEW 1-014 Compound tunicate. Encrusting; thin; tunic mustard yellow-orange; zooids scattered, bright orange, not in cycles. (vouchered) (small sample)
- 

16 Sept. 1992 (cont.)

? NEW

1-015 Acanthogorgia hirsuta? Fits Carpine & Grasshoff (1975), p. 68. (vouchered)

1-016 ? Botryllus (see 14/09/92-10/14). (vouchered)

1-017 Paralcyonium spinulosum. Fits description in Riedl (p. 200/201). This may be what Jose Maria Tur called Maasella edwardsi in 1991. (vouchered)

1-018 to 1-024 = no samples

sponges

1-025 Callyspongiidae sp. A

1-026 Axinella daniicornis - tall, branching, gorgonian-like yellow sponge (RCB has underwater photo).

1-027 Hamigera hamigera - red papillose encrusting sponge; RCB has underwater photo.

1-028 Agelas oroides

1-029 Axinella polypoides

1-030 Petrosia sp. B

1-031 Raspailia sp. A

1-032 Haliclona sp. B

17 September 1992

Columbretes Islands.

Dive #1. Busca/Wetzer 112 ft., 59 min.

1-001 to 1-010 = sponges

17/09/92 1-011 Aplidium conicum

1-012 Hacelia attenuata. Uniform light orange in color;
25cm diam span.

1-013 Peltodoris atroraculata

1-014 Eudendrium rameum

1-015 Hippodiplosia sp. A

1-016 Cladocora caespitosa

1-017 ? Holothuria sp. Solid chocolate brown; ventrum
weakly defined. (voucher of skin saved)

1-018 Aglaophenia elongata (see 14/09/92-1012)

1-019 Hydroid (voucher retained). Long yellow-tan
whips (~12") w/very thin feathery side branches
(~1cm long); ~10-20 stalks arise from a
hold fast.



1-020 Sphaerechinus granularis

1-021 Paracentrotus lividus

Dive #2.

2-001 sponge

2-002 Thais ? haemostoma

2-003 ? Didemnum gelatinosum (vouchered) (new)

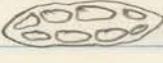
to 1cm
ng-white,
t surrounding
p; spicules
bubble in vinegar

18 Sept. 1992

Canabretes Islands.

Dive #1.

Brusca/Vega, 130', 60 min.

- 18/09/92-1-001 *Cladocora caespitosa*
1-002 ? *Aurelia aurita* (new)
1-003 gastropod egg case (!: *Buccinum* sp.) (new)
1-004 *Echinaster sepositus*
1-005 *Ophioderma longicauda*
1-006 *Aplidium conicum*
1-007 ? *Holothuria* sp. A  spicules Solid brown cucumbers,
massive Cuvierian organs.
1-008 *Holothuria forskali*?
1-009 *Botryllus schlosseri* (new) (vouchered)
1-010 *Sidnyum turbinatum* (new) (vouchered)
1-011 *Holothuria tubulosa* [gut sample for micro]
1-012 *Rapana venosa* (new)
1-013 *Paracentrotus lividus* [gut sample for micro]
1-014 *Pinna nobilis* [gut sample for micro] - commensal shrimp retained
for sp. A
1-015 *Cerianthus membranaceus*, tube only (new)
1-016 (No sample)

Dive #2.

Brusca/Vega/Conner/Tapiolas; 70'; 20 min.

18-09-92-2-002 *Aplidium* sp. C

2-001 *Collyspongiidae* sp. A

21 Sept. 1992

Dive #1:

Isla Tabarca, La Barbá. Staying at Hotel Rocas Blancas
Santa Pola (Cabo de Santa Pola), So. of Alicante.
Brusca/vega, 135', 40 min.

Mud bottom, isolated rocks.

2109/92-1-001 Sphaerechinus granularis

002 Peltodoris atromaculata

003 Luidia ciliaris (new)

004 Filograna implexa Salmacina (S. disteri?)

005 Egg cases of squid (Loligo?)

006 Pelagia noctiluca. Brown/purple spots on
umbrellar surface; diameter 3 cm. (new)

No extracts
prepared -
not 2 gms.

{ 007 Bonellia viridis

008 Alcyonium acaule

009 dolid nudibranch: apricot orange w/ hard white bumps.

(vouchered) 010 ? Aplidium sp. C (= 22/09/91-1034): Tunic opaque white;
scattered zooids
orange & brown.
(= Diazona sp.)

(vouchered) 011 Compound tunicate #A

012 Encrusting, but massive; colony

to 4 cm x 18 cm; tunic opaque milky-white;

zooids orange & located deep within colony

(beneath ~5 mm of opaque tunic); no CaCO₃ crystals

(New.)

(vouchered) 012 ? Distaplia sp. Brown-orange tunic with large

orange atria; soft & mushy; zooids

bright orange; no apparent CaCO₃ crystals.

(New)

Sponges { 013 Axinella damicornis

014 " verrucosa

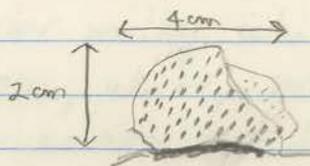
015 Aeglas oroides

- Sponges {
- 016 *Cacospongia scalaris*
 - 017 *Hymeniacidonidae* sp. B
 - 018
 - 019 *Acanthella acuta*

Dive #2: Off Isla Tabarca

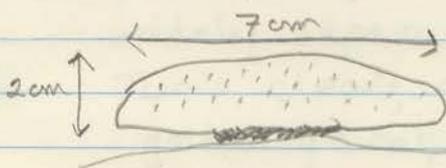
Wetter/Brasca 65ft. 65min

- Sponges {
- 21/09/92-2001 *Axinella damicornis*
 - 21/09/92-2002 *Clathrina clathrus*
 - 2003 *Aeglas oroides*
 - 2004 *Acanthella acuta*
 - 2005
 - 2006 *Sphaerechinus granularis*
 - 2007 *Peltodoris atromaculata*
 - 2008 *Aplysia depilans* (150-250g)
 - (vouchered) 2009 ? *Aplidium* sp. C (see 21/09/92-1010) (= *Diazona*?)
 - (vouchered) 2010 ? *Aplidium* sp. G.



Tunic translucent pale orange; zooids deep dark orange, not arranged in any obvious pattern; long straight zooids running in vertical/parallel fashion.

- (vouchered) 2011 ? *Aplidium* sp. H

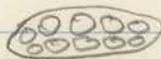


Tunic translucent, glassy; zooids pale yellow, not arranged in any obvious pattern.

- 2012 *Ascidian* sp. A (= 20/09/91-1020) Compound ascidian

- (vouchered) 2013 ? *Holothuria* sp. A (= 18/09/92-1-007) solid brown cucumbers; papillae darker brown; 4-5 windows.

- (vouchered) 2014 ? *Holothuria* sp. B



4-6 pairs of windows in each spicule; solid brown w/ white halo around papilla

22 September 1992. Islas Hormigas, off Cabo de Palos.
Housed in apartments near El Puerto de Mazarron, W. of
Cartegena.

Dive #1. Brusca/Wetzer, 85', 51 min.

- 22/09/92-1001 Clathrina clathrus (Sponge)
1002 Axinella damicornis (Sponge)
1003 Sphaerechinus granularis
1004 Peltodaris atramaculata
1005 Ophidiaster ophidianus
1006 Hacelia attenuata (yellow form)
1007 Marthasterias glacialis (micro sample also taken - of gut)
1008 Alcyonium acaule
1009 Paramuricea clavata (= P. chamaeleon)
1010 Halocordyle disticha (hydroid) (new)
1011 ? Pseudodistoma sp. Massive colonies (1-4 cm thick),

encrusting rocks at ~40'-80'. Smoky black exterior,
with scattered white zooids (not in cycles).

Interior milky white, opaque. "Spicules"
fusiform, white, not CaCO_3 . Zooids white
with salmon spot (endostyle?). (Vouchered)

[maybe Diplosoma sp.]

- 1012 Clavelina sp. Zooids large, 3-4 cm tall,
widely separated and appearing solitary.
Tunic clear; pharynx banded with
golden yellow; endostyle purple-black;
gut large, dark brown with white
flecks. Does not quite resemble C.
nana or C. lepadiformis. (new)
(Vouchered)

Similar to
Botryllodes sp. B
of 91. Epallation, but
colonies larger and with
surface pits.

Dive #1 (cont.)

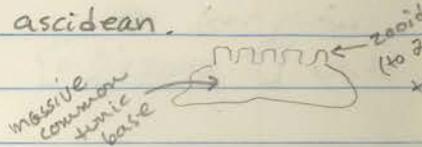
Tunic not firm, but fragile & tending to disintegrate.

1013. ? Aplidium sp. I (Maybe A. nordmani). Tunic translucent w/orange tint; zooids dark orange, not in cycles, long and curled or twisted (not straight as in ? Aplidium sp. G of 21/09/92-2010). Encrusting lobes, to 2-4 cm across. Very common in Hormigas. Possibly Aplidium albicans.

1014 ? Distomus hufferi. Small social intense yellow ascidean; forms thin fragile mats on shaded rocks; rare; somewhat resembling the fragile yellow sponge Clathrina. (new) (vouchered)

1015 Parazoanthus sp. (= 16/09/92-1013)

1016 Diazona violacea (new) (vouchered). Massive, football-sized compound/social ascidean.



Dive #2.

Brusca/Wetzer to 81', for 45 min.

- 22/09/92-2001
 - 2002
 - 2003
 - 2004
- } sponges

2005 Haecilia attenuata

2006 Sphaerechinus granularis

2007 Peltodoris atromaculata

2008 Marthasterias glacialis

2009 Pentapora sp. A (= Hipposiplosia). Resembles P. fascialis but w/different aperture shape. (vouchered) (new)

apertures on aperture.

Dive #2 (cont.)

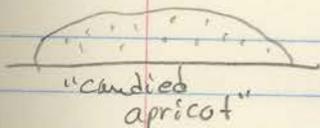
2010 ? Aplidium sp. I (= 22/09/92-1013)

2011 Aplidium albicans (vouchered)



2012

2012 ? Aplidium sp. J. Encrusting, to 10cm across; orange opaque tunic; zooids scattered, lying in all directions; stalk pale orange, head red. (vouchered) Tunic firm.

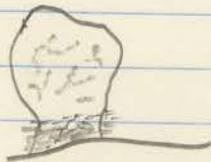


2013 ? Aplidium sp. K. Like giant A. albicans with short fat stalk; to 8cm tall; color as in 2012 (above).



2014 ? Aplidium sp. C (vouchered) [= Diazona ?] white.

2015 ? Aplidium sp. L (probably = Aplidium sp. B of 1992 expedition). Tunic milky white; zooids red-orange; 2-3 cm tall.



(vouchered)

2016. Green compound ascidean. Encrusting, .5-1cm thick; tunic translucent green w/ disk-like "spicules" (not CaCO_3); zooids dark green, minute, in circlets on surface.



(new ?) (vouchered)

Dive #2 (cont.)

2017 Sabella pavonina

2018 Eunicella singularis (white gorgonian)

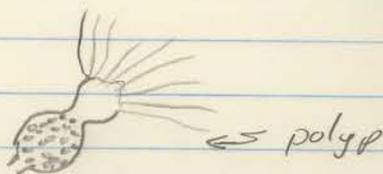
23 September 1992: Islas Hermigas.

Dive #1. Brusca/Wetzer 110ft./50min., Brusca to 135' with E. Vega to examine sunken ship, Vega to 190'.

23/09/92-1-001 } sponges.

002 }

003 Eudendrium sp.



004 ? Aplidium sp. I

005 Sphaerechinus granularis

006 Clavelina sp. (= 22/09/92-1012)

007 Nudibranch egg mass

008 Ophiomyxa pentagona (microsample of gut taken)

009 Ophidiaster ophidianus

010 ? Pseudodistoma sp. (= 22/09/92-1011)

011 Sabella pavonina

! NEW

012 Green compound ascidean (= 22/09/92-2010)

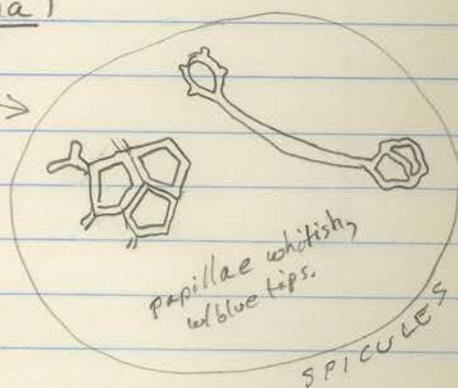
013 ? Aplidium sp. J (= 22/09/92-2012)

014 ? Aplidium sp. C (= Diazona)

015 Halocordyle disticha

016 Holothuria forskali ? →

017 Marthasterias glacialis



23 sept. (cont.)

Dive #2. Brusca/Wetzer, 48', 53 mins.

23/09/92-2001

2002

2003

} sponges

2004 Sphaeredichus granulavis

2005 Margaretta cerioides

2006 ? Pseudodistoma (= 22/09/92-1011)

2007 Green compound ascidean (= 22/09/92-2016)

2008 ? Aplidium sp. C (= Diazona?)

2009 ? Aplidium sp. J

2010 ? Aplidium sp. I

2011 ? Aplidium sp. L

2012 Sabella pavonina

2013 Peltodoris atromaculata

NEW

2014 Phascolosoma sp.

24. September 1992

Dive #1. Brucá/Vega 91 ft. / 50 min. } Off Cabo Falcón
Wetzer/Kukurten 80 ft. / 50 min. } (between Mazarrón
& Cartagena)

24/09/92 - 1001 }
1002 } sponges
1003 }
1004 }

1005 Sphaerechinus granularis

1006 Platydoris argo

1007 Lineus bilineatus (new)

1008 Alicia mirabilis (new)

1009 Salpa maxima (new)

1010 Peltochordis atrovacuolata

1011 Echinaster sepositus (+ micro sample)

1012 octopus eggs (octopus sp.) (new)

1013 ? Aplidium sp. J

1014 Sabella pavonina

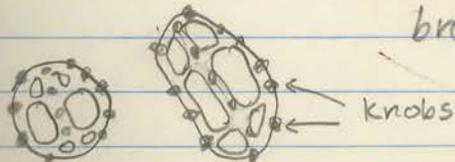
1015 Pelagia noctiluca

1016 Sertella beaniana

1017 Pentapora fascialis

1018 compound ascidean. Thin (2-3 mm), encrusting, greyish. Tunic translucent grey; zooids black, comma-shaped, arranged randomly (not in any pattern). (new) (vouchered)

1019 Holothuria tubulosa. Dark chocolate brown on dorsum; flattened sole mottled brown & light tan; Knobby spicules.



24. September 1992 cont.

Dive #2. Bruca/water 58 ft. / 52 min. Wall dive just E.
of Cabo Falcón.

- 24/09/92-2001 }
-2002 } sponges
2003 }
2004 }
2005 Sphaerechinus granularis
2006 Hypselodoris elegans (on yellow sponge)
2007 Pentapora fascialis
2008 Compound ascidean (= 24/09/92, dive #1, 1018)
2009 Sabella pavonina
2010 ? Aplidium sp. J
2011 ? Distomus hupferi (= 22/09/92 - 1014)
2012 ? Aplidium sp. C (= Diazona ?)
NEW 2013 Cerianthus membranaceus
2014 ? Phallusia fumigata
2015 Sabella pavonina
2016 Asciidiidae sp. A. Black solitary ascidean;
attached all along one side; to 7cm.
(vouchered)
2017 Halocordyle disticha (hydroid)

RCB photo of urchin tests (oral view), left-to-right:
Sphaerechinus granularis, Paracentrotus
lividus, Arbacia lixula.

25 September 1992.

Dive #1. Bruja/Wetzer 115 ft. / 52 min. Wall dive along coastal cliffs, Cabo Falcón.

25/09/92 - 1001

1002

1003

1004

1005

1006

1007

1008

1009

1010

} sponges

1011 Aglaophenia elongata

1012 Sphaerechinus granularis

1013 Cotylorhiza tuberculata

1014 Diazona violacea

1015 Peltodoris atromaculata

1016 Platydoris argo

1017 Compound ascidean (= 24/09/92-1018)

1018 Salpa maxima

1019 Marthasterias glacialis

1020 ? Aplidium sp. J

NEW 1021 ? Aplidium sp. M. Encrusting & firm, like Aplidium sp. J, but more translucent w/ zooids obvious.

NEW 1022 Hippodiplosia sp. B. Like H. foliacea, but branches thinner.

1023 Hippodiplosia foliacea

NEU

1024

Sertella beauiana

1025

Ascidia mentula

12-11-85.

Brusca got a strong (delayed) reaction[^] after this dive, in which his right hand swelled up to point of near immobilization. The swelling was focused on the index finger, which had some previous deep lacerations. That finger also turned red, and red streaks ran from it up his forearm ~ 8". The red area was quite painful. I presume this was a reaction to nematocysts in the Aglaophonia elongata, a large amount of which was collected with the right hand. Some stinging sensation was noted specifically in the index finger lacerations during the collecting. Symptoms persisted for 4-10 days.

Summary

1. 204 invert samples taken (non-sponge)
2. About 25 new (?) species.
3. 6 from "hit list" collected

- Extractions (on site) are made with methanol acetone.
- Other solutes used in lab, once compounds are identified.
- PharmaMar is currently screening for:

(1) HIV. The anti-HIV tests are being done in Glynna Faircloth's lab in Boston, by Glynna & Sue Cross.

(2) Immunological suppressants/enhancements. Also by Glynna & Sue.

(3) Anti-tumor screening, using a variety of tumor cell lines (e.g. human colon cancer, lamb liver cancer, monkey kidney cancer, etc.)

(4) Enzyme inhibition studies.