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Meeting of Experts on the finalization of the Classification of benthic marine habitat types for the Mediterranean region and the Reference List of Marine and Coastal Habitat Types in the Mediterranean

Rome, Italy, 22-23 January 2019

**Agenda item 5: Draft Updated Reference List of Marine Habitat Types for the  
Mediterranean region****Draft Updated Reference List of Marine Habitat Types for the Mediterranean region**

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**Draft Updated Reference List of Marine Habitat Types for the Mediterranean region**



## LITTORAL

### MA1.5 Littoral rock

#### MA1.51 Supralittoral rock

MA1.51a Supralittoral euryhaline and eurythermal pools (enclave of mediolittoral)

MA1.51b Wracks of dead leaves of macrophytes

#### MA1.52 Mediolittoral caves

#### MA1.53 Upper mediolittoral rock

MA1.531 Association with encrusting Corallinales (e.g. belts of *Lithophyllum bissoides*, *Neogoniolithon* spp.)

MA1.533 Facies with the Bivalvia *Patella ferruginea* or *Patella nigra*

#### MA1.54 Lower mediolittoral rock

MA1.541 Association with encrusting Corallinales (e.g. belts of *Lithophyllum bissoides*, *Neogoniolithon* spp.)

MA1.542 Association with Fucales

MA1.544 Facies with *Pollicipes pollicipes*

MA1.545 Facies with Vermetidae (*Dendropoma* spp.) (vermetid reefs)

MA1.54a Mediolittoral euryhaline and eurythermal pools (enclave of infralittoral)

### MA2.5 Littoral biogenic habitat

#### MA2.51 Lower mediolittoral biogenic habitat

MA2.511 Association with encrusting Corallinales (platforms)

MA2.512 Facies with *Sabellaria* spp. (reefs of *Sabellaria*)

MA2.513 Facies with Vermetidae (*Dendropoma* spp.) (vermetid reefs)

MA2.51a Banks of dead leaves of macrophytes (*banquette*)

### MA3.5 Littoral coarse sediment

#### MA3.51 Supralittoral coarse sediment

MA3.511 Association with macrophytes

MA3.51a Banks of dead leaves of macrophytes (*banquette*)

#### MA3.52 Mediolittoral coarse sediment

MA3.521 Association with marine angiosperms

MA3.52a Banks of dead leaves of macrophytes (*banquette*)

### MA4.5 Littoral mixed sediment

#### MA4.51 Supralittoral mixed sediment

MA4.511 Association with macrophytes

MA4.51a Banks of dead leaves of macrophytes (*banquette*)

#### MA4.52 Mediolittoral mixed sediment

MA4.521 Association with marine angiosperms

MA4.52a Banks of dead leaves of macrophytes (*banquette*)

MA5.5 Littoral sand

MA5.51 Supralittoral sands

MA5.511 Association with macrophytes

MA5.51a Banks of dead leaves of macrophytes (*banquette*)

MA5.52 Mediolittoral sands

MA5.521 Association with marine angiosperms

MA5.52a Banks of dead leaves of macrophytes (*banquette*)

MA6.5 Littoral mud

MA6.51 Supralittoral mud

MA6.511 Association with macrophytes

MA6.52 Mediolittoral mud

MA6.52a Lagoons and estuaries

MA6.521a Association with halophytes (*Salicornia* spp.) or marine angiosperms  
(e.g. *Zostera noltei*, *Ruppia maritima*)

## **INFRA LITTORAL**

MB1.5 Infralittoral rock

MB1.51 Algal-dominated infralittoral rock

MB1.51a Well illuminated infralittoral rock, exposed

MB1.511a Association with Fucales

MB1.513.a Association with the encrusting Corallinales *Titanoderma trochanter*  
or *Tenarea tortuosa*

MB1.514a Association with indigenous Mediterranean *Caulerpa* spp.

MB1.516a Facies with Scleractinia (e.g. *Cladocora caespitosa*)

MB1.51b Moderately illuminated infralittoral rock, exposed

MB1.512b Association with indigenous Mediterranean *Caulerpa* spp.

MB1.515b Facies with Scleractinia (e.g. *Astroides calycularis*)

MB1.51c Well illuminated infralittoral rock, sheltered

MB1.511c Association with Fucales

MB1.514c Association with indigenous Mediterranean *Caulerpa* spp.

MB1.516a Facies with Scleractinia (e.g. *Cladocora caespitosa*)

MB1.51d Moderately illuminated infralittoral rock, sheltered

MB1.512d Association with indigenous Mediterranean *Caulerpa* spp.

MB1.514d Facies with Alcyonacea (e.g. *Eunicella* spp.)



MB1.51e Lower infralittoral rock moderately illuminated

MB1.511e Association with Fucales

MB1.512e Association with Laminariales (kelp beds)

MB1.513e Association with indigenous Mediterranean *Caulerpa* spp.

MB1.515e Facies with Alcyonacea (e.g. *Eunicella* spp.)

MB1.516e Facies with Scleractinia (e.g. *Cladocora caespitosa*)

MB1.52 Invertebrate-dominated infralittoral rock

MB1.52a Moderately illuminated infralittoral rock, sheltered

MB1.521a Association with indigenous Mediterranean *Caulerpa* spp.

MB1.523a Facies with Scleractinia (e.g. *Astroides calycularis*, *Cladocora caespitosa*, *Polycyathus muelleriae*, *Pourtalesmilia anthophyllites*)

MB1.524a Facies with Alcyonacea (e.g. *Eunicella* spp., *Paramuricea clavata*, *Corallium rubrum*)

MB1.53 Infralittoral rock affected by sediments

MB1.531 Facies with large and erect sponges (e.g. *Axinella polypoides*, *Axinella cannabina*)

MB1.532 Facies with Scleractinia (e.g. *Cladocora caespitosa*)

MB1.533 Facies with Alcyonacea (e.g. *Eunicella* spp., *Leptogorgia* spp.)

MB1.54 Euryhaline and eurythermal lagoons

MB1.541 Association with Fucales

MB1.55 Coralligenous (enclave of circalitoral, see MC1.51)

MB1.56 Semi-dark caves and overhangs (see MC1.53 for examples of reference associations and facies)

MB2.5 Infralittoral biogenic habitat

MB2.51 Reefs in algal-dominated habitat

MB2.511 Facies with Vermetidae (*Dendropoma* spp.) (vermetid reefs)

MB2.52 Reefs on fine sand in very shallow waters

MB2.521 Facies with *Sabellaria* spp. (reefs of *Sabellaria*)

MB2.53 Seagrass meadows

MB2.531 *Posidonia oceanica* meadow on rock

MB2.532 *Posidonia oceanica* meadow on matte

MB2.533 *Posidonia oceanica* meadow on sand, coarse or mixed sediment

MB2.534 Dead matte of *Posidonia oceanica*

MB2.535 Fringing reef, barrier reef, atolls of *Posidonia oceanica*

MB2.536 Association of *Posidonia oceanica* with *Cymodocea nodosa* or *Caulerpa* spp.

MB2.537 Association of *Cymodocea nodosa* or *Caulerpa* spp. with dead matte of *Posidonia oceanica*

MB2.538 Facies with the Bivalvia *Pinna nobilis*

### MB3.5 Infralittoral coarse sediment

MB3.51 Infralittoral coarse sediment mixed by waves

MB3.511 Association with rhodolithes

MB3.52 Infralittoral coarse sediment under the influence of bottom currents

MB3.521 Association with maërl (e.g. *Lithothamnion* spp., *Neogoniolithon* spp., *Lithophyllum* spp., *Spongites fruticulosa*)

MB3.522 Association with rhodolithes

### MB5.5 Infralittoral sand

MB5.52 Well sorted fine sand

MB5.521 Association with marine angiosperms

MB5.53 Fine sand in sheltered waters

MB5.531 Association with marine angiosperms

MB5.532 Association with indigenous Mediterranean *Caulerpa* spp.

MB5.538 Facies of *Tritia neritea* and nematodes (in hydrothermal vents)

MB5.54 Euryhaline and eurythermal lagoons

MB5.541 Association with marine angiosperms or other halophyta

MB5.542 Association with Fucales

### MB6.5 Infralittoral mud sediment

MB6.51 Euryhaline and eurythermal lagoons

MB6.511 Association with marine angiosperms or other halophyta

## **CIRCALITTORAL**

### MC1.5 Circalittoral rock

MC1.51 Coralligenous

MC1.51a Algal-dominated coralligenous

MC1.512a Association with Fucales or Laminariales

MC1.514a Association with *Ptilophora mediterranea* or *Schimmelmannia schousboei*

MC1.51b Invertebrate-dominated coralligenous

MC1.512b Facies with large and erect sponges (e.g. *Spongia lamella*, *Sarcotragus foetidus*, *Axinella* spp.)

MC1.514b Facies with Alcyonacea (e.g. *Eunicella* spp., *Leptogorgia* spp., *Paramuricea* spp., *Corallium rubrum*)

MC1.516b Facies with the Zoantharia *Savalia savaglia*

MC1.517b Facies with Scleractinia (e.g. *Dendrophyllia* spp., *Leptopsammia pruvoti*, *Madracis pharensis*)

MC1.518b Facies with Vermetidae and/or Serpulidae reefs

MC1.519b Facies with Bryozoa (e.g. *Reteporella grimaldii*, *Pentapora fascialis*)

MC1.51c Invertebrate-dominated coralligenous covered by sediment

See MC1.51b for reference associations and facies

MC1.52 Shelf edge rock

MC1.52a Coralligenous outcrops

MC1.523a Facies with Alcyonacea (e.g. *Alcyonium* spp., *Eunicella* spp., *Leptogorgia* spp., *Paramuricea* spp., *Corallium rubrum*)

MC1.524a Facies with Antipatharia (black corals forest, e.g. *Antipathella subpinnata*)

MC1.525a Facies with Scleractinia (e.g. *Dendrophyllia* spp., *Madracis pharensis*)

MC1.526a Facies with Bryozoa (e.g. *Reteporella grimaldii*, *Pentapora fascialis*)

MC1.52b Coralligenous outcrops covered by sediment

See MC1.52a for reference associations and facies

MC1.52c Deep banks

MC1.521c Facies with Antipatharia (black corals forest, e.g. *Antipathella subpinnata*)

MC1.522c Facies with Alcyonacea (e.g. *Nidalia studeri*)

MC1.523c Facies with Scleractinia (e.g. *Dendrophyllia* spp.)

MC1.53 Semi-dark caves and overhangs

MC1.53a Walls and tunnels

MC1.531a Facies with sponges (e.g. *Axinella* spp., *Chondrosia reniformis*, *Petrosia ficiformis*)

MC1.533a Facies with Alcyonacea (e.g. *Eunicella* spp., *Paramuricea* spp., *Corallium rubrum*)

MC1.534a Facies with Scleractinia (e.g. *Leptopsammia pruvoti*, *Phyllangia mouchezii*)

MC1.536a Facies with Bryozoa (e.g. *Reteporella grimaldii*, *Pentapora fascialis*)

MC1.53b Ceilings

See MC1.53a for reference facies

MC1.53c Detritic bottom

See MC3.51 for reference associations and facies

MC1.53d Brackish water caves or caves subjected to freshwater runoff

MC1.531d Facies with *Lithistida* spp. sponges

MC2.5 Circalittoral biogenic habitat

MC2.51 Coralligenous platforms

MC2.512 Association with Fucales

MC2.515 Facies with large and erect sponges (e.g. *Spongia lamella*, *Sarcotragus foetidus*, *Axinella* spp.)

MC2.517 Facies with Alcyonacea (e.g. *Alcyonium* spp., *Eunicella* spp., *Leptogorgia* spp., *Paramuricea* spp., *Corallium rubrum*)

MC2.518 Facies with the Zoantharia *Savalia savaglia*

MC2.519 Facies with Scleractinia (e.g. *Dendrophyllia* spp., *Madracis pharensis*, *Phyllangia mouchezii*)

MC2.520 Facies with Vermetidae and/or Serpulidae reefs

MC2.521 Facies with Bryozoa (e.g. *Reteporella grimaldii*, *Pentapora fascialis*)

MC3.5 Circalittoral coarse sediment

MC3.51 Coastal detritic bottoms (without rhodoliths)

MC3.511 Association with Laminariales

MC3.512 Facies with Alcyonacea (e.g. *Alcyonium* spp., *Eunicella* spp., *Leptogorgia* spp.)

MC3.513 Facies with Pennatulacea (e.g. *Pennatula* spp., *Virgularia mirabilis*)

MC3.516 Facies with Bryozoa (e.g. *Turbicellepora incrassata*, *Fron dipora verrucosa*, *Pentapora fascialis*)

MC3.517 Facies with Crinoidea (e.g. *Leptometra* spp.)

MC3.52 Coastal detritic bottoms with rhodoliths

MC3.521 Association with maërl (e.g. *Lithothamnion* spp., *Neogoniolithon* spp., *Lithophyllum* spp., *Spongites fruticulosa*)

MC3.522 Association with *Peyssonnelia* spp.

MC3.523 Association with Laminariales

MC3.525 Facies with Alcyonacea (e.g. *Alcyonium* spp., *Paralcyonium spinulosum*)

MC3.526 Facies with Pennatulacea (e.g. *Veretillum cynomorium*)

MC4.5 Circalittoral mixed sediment

MC4.51 Muddy detritic bottoms

MC4.512 Facies with Alcyonacea (e.g. *Alcyonium* spp., *Spinimuricea* spp.)

MC4.513 Facies with Pennatulacea (e.g. *Veretillum cynomorium*)

MC5.5 Circalittoral sand

MC5.513 Facies with Crinoidea (e.g. *Leptometra* spp.)

MC6.5 Circalittoral mud sediment

MC6.51 Coastal terrigenous muds

MC6.511 Facies with Alcyonacea (e.g. *Alcyonium* spp.)

MC6.512 Facies with Pennatulacea (e.g. *Pennatula* spp., *Virgularia mirabilis*)

## **OFFSHORE CIRCALITTORAL**

MD1.5 Offshore circalittoral rock

MD1.51 Offshore circalittoral rock invertebrate-dominated

MD1.513 Facies with large and erect sponges (e.g. *Spongia lamella*, *Axinella* spp.)

MD1.514 Facies with Alcyonacea (e.g. *Alcyonium* spp., *Callogorgia verticillata*, *Ellisella paraplexauroides*, *Eunicella* spp., *Leptogorgia* spp., *Paramuricea* spp., *Swiftia pallida*, *Corallium rubrum*)

MD1.515 Facies with Antipatharia (black corals forest, e.g. *Antipathella subpinnata*)

MD1.516 Facies with Scleractinia (e.g. *Dendrophyllia* spp., *Madracis pharensis*)

MD1.518 Facies with the Zoantharia *Savalia savaglia*

MD1.522 Facies with Bryozoa (e.g. *Myriapora truncata*, *Pentapora fascialis*)

MD1.52 Offshore circalittoral rock invertebrate-dominated covered by sediments

See MD1.51 for reference associations and facies

MD1.53 Deep offshore circalittoral banks

MD1.531 Facies with Antipatharia (black corals forest, e.g. *Antipathella subpinnata*)

MD1.532 Facies with Alcyonacea (e.g. *Nidalia* spp.)

MD1.533 Facies with Scleractinia (yellow corals forest, e.g. *Dendrophyllia* spp.)

MD2.5 Offshore circalittoral biogenic habitat

MD2.51 Offshore reefs

MD2.511 Facies with Vermetidae and/or Serpulidae reefs

MD3.5 Offshore circalittoral coarse sediment

MD3.51 Offshore circalittoral detritic bottoms

MD3.512 Facies with the Bivalvia *Neopycnodonte* spp.

MD3.515 Facies with Crinoidea (e.g. *Leptometra* spp.)

MD4.5 Offshore circalittoral mixed sediment

MD4.51 Offshore circalittoral detritic bottoms on shelf edge

MD4.512 Facies with the Bivalvia *Neopycnodonte* spp.

MD4.515 Facies with Crinoidea (e.g. *Leptometra* spp.)

MD5.5 Offshore circalittoral sand

MD5.512 Facies with the Bivalvia *Neopycnodonte* spp.

MD5.515 Facies with Crinoidea (e.g. *Leptometra* spp.)

MD6.5 Offshore circalittoral mud

MD6.51 Coastal terrigenous sticky muds

MD6.511 Facies with Pennatulacea (e.g. *Pennatula* spp., *Virgularia mirabilis*)

MD6.513 Facies with the Bivalvia *Neopycnodonte* spp.

**UPPER BATHYAL**

ME1.5 Upper bathyal rock

ME1.51 Upper bathyal rock invertebrate-dominated

ME1.512 Facies with large and erect sponges (e.g. *Spongia lamella*, *Axinella* spp.)

ME1.513 Facies with Antipatharia (black corals forest, *Antipathes* spp., *Leiopathes glaberrima*, *Parantipathes larix*)

ME1.514 Facies with Alcyonacea (e.g. *Acanthogorgia* spp., *Callogorgia verticillata*, *Placogorgia* spp., *Swiftia pallida*, *Corallium rubrum*)

ME1.515 Facies with Scleractinia (yellow corals forest, e.g. *Dendrophyllia* spp.; white corals forest, e.g. *Madrepora oculata*, *Desmophyllum cristagalli*, *Lophelia pertusa*, *Madracis pharensis*)

ME1.516 Facies with Cirripeda (e.g. *Megabalanus* spp., *Pachylasma giganteum*)

ME1.517 Facies with Crinoidea (e.g. *Leptometra* spp.)

ME1.518 Facies with the Bivalvia *Neopycnodonte* spp.

ME1.52 Caves and ducts in total darkness (enclave of lower bathyal)

ME1.52a Muddy bottom

ME1.52b Walls and ceilings

ME1.52c Walls and ceilings in anchialine environments

ME2.5 Upper bathyal biogenic habitat

ME2.51 Upper bathyal reefs

ME2.512 Facies with large and erect sponges (e.g. *Leiodermatium* spp.)

ME2.513 Facies with Scleractinia (white corals forest, e.g. *Madrepora oculata*, *Desmophyllum cristagalli*)

ME2.514 Facies with the Bivalvia *Neopycnodonte* spp.

ME2.515 Facies with Serpulidae reefs (e.g. *Serpula vermicularis*)

ME2.52 Thanatocoenosis of the white corals (on seamounts)

See ME1.51 for reference facies

ME3.5 Upper bathyal coarse sediment

ME3.511 Facies with Alcyonacea (e.g. *Alcyonium* spp., *Chironophthya mediterranea*, *Paralcyonium spinulosum*, *Paramuricea* spp., *Villogorgia bebrycoides*)

ME4.5 Upper bathyal mixed sediment

ME4.511 Facies with the Bivalvia *Neopycnodonte* spp.

ME5.5 Upper bathyal sand

ME5.51 Upper bathyal detritic sand

ME5.512 Facies with Pennatulacea (e.g. *Pennatula* spp., *Pteroeides griseum*)

ME5.513 Facies with Crinoidea (e.g. *Leptometra* spp.)

ME5.515 Facies with the Bivalvia *Neopycnodonte* spp.

ME5.517 Facies with Bryozoa

ME6.5 Upper bathyal muds

ME6.512 Facies with Pennatulacea (e.g. *Pennatula* spp., *Funiculina quadrangularis*)

ME6.513 Facies with Alcyonacea (e.g. *Isidella elongata*)

ME6.514 Facies with Scleractinia (yellow corals forest, e.g. *Dendrophyllia* spp.; white corals forest, e.g. *Madrepora oculata*, *Desmophyllum cristagalli*)

ME6.516 Facies with Crinoidea (e.g. *Leptometra* spp.)

ME6.518 Facies with the Bivalvia *Neopycnodonte* spp.

ME6.521 Facies with Bryozoa (e.g. *Candidae* spp., *Kinetoskias* spp.)

ME6.522 Facies with giant Foraminifera (e.g. *Astrorhizida*)

## **LOWER BATHYAL**

MF1.5 Lower bathyal rock

MF1.512 Facies with Alcyonacea (e.g. *Isidella elongata*)

MF1.513 Facies with Scleractinia (yellow corals forest, e.g. *Dendrophyllia* spp.; white corals forest, e.g. *Madrepora oculata*, *Desmophyllum cristagalli*, *Lophelia pertusa*)

MF1.52 Caves and ducts in total darkness

MF2.5 Lower bathyal biogenic habitat

MF2.51 Lower bathyal reefs

MF2.511 Facies with Scleractinia (yellow corals forest, e.g. *Dendrophyllia* spp.; white corals forest, e.g. *Madrepora oculata*, *Desmophyllum cristagalli*, *Lophelia pertusa*)

MF2.52 Thanatocoenosis of the white corals (on seamounts)

See MF1.5 for reference facies

MF6.5 Lower bathyal muds

MF6.51 Sandy muds

MF6.512 Facies with Alcyonacea (e.g. *Isidella elongata*)

MF6.514 Facies with Pennatulacea (e.g. *Pennatula* spp.)

MF6.52 Compact muds

MF6.522 Facies with Alcyonacea (e.g. *Isidella elongata*)

MF6.524 Facies with Pennatulacea (e.g. *Pennatula* spp., *Funiculina quadrangularis*)

## **ABYSSAL**

MG1.5 Abyssal rock

MG1.512 Facies with Alcyonacea

MG6.5 Abyssal mud

MG6.512 Facies with Alcyonacea (e.g. *Isidella elongata*)

**The following specific geomorphologic / hydrologic features were not considered in this list because their presence is independent from the depth zone and the substrate type:**

- A. Hydrothermal vents
- B. Cold seeps (methane and sulfide)
- C. Freshwater resurgences
- D. Seamounts
- E. Canyons