ALGAL AND HALOPHYTIC COMMUNITIES AT MONTENEGRIN SEASHORES, SE. ADRIATIC

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Abstract. This is a first survey of the littoralphytocenoses along the Montenegrin seashores, including 19 benthic communities of the marine algae, and 21 ones of the vascular halophytes. The most exposed and diversified vegetation occur in the Platamun cape, and Boka Kotorska includes a rich lagunar phytobenthc .

Résumé : Communautés algales et halophiles du Littoral Monténégrin. Nous présentons une première revue des phytocénoses littorales en Adriatique du sud-est, comprenant 19 communautés benthiques d'algues marines et 21 à halophytes vasculaires. C'est le littoral le plus pluvieux (jusqu'à 3.000 mm), le plus chaud et le plus exposé aux rafales de sirocco en Adriatique. Le site le plus battu à végétation littorale la plus diversifiée est le cap Platamun près du port de Budva, et le phytobenthos lagunaire est le mieux développé dans le golfe de Boka Kotorska.

The littoral vegetation of SE.Adriatic is among the least studied ones in the Mediterranean: except a paper on the halophytes of Tivat Bay (Jankovic and Stevanovic 1983), and rare notes on algal flora (Heufler 1857, Solazzi 1971), any details on the littoral phytocenoses are lacking. Thus one acknowledges to UNESCO for a support in the recent studies of Boka Kotorska Gulf.

Ecological specialities. This littoral is almost abrupt, rocky and calcareous in NW.part, shingly-marly (flysch) in middle one, and chiefly sandy-muddy alluvial in SE.end. Such a coast without isles is very exposed to the Siroco storms from open sea and also to the warm Otranto current from the Mediterranean, being the warmest in Adriatic, and the most rainy one in the entire Mediterranean: up to 3000 mm in Risan Bay. The Boka Kotorska Gulf there is an exception presenting a cooler, sheltered brackish lagoon with abrupt rocky shores. The most exposed and richest site in the endemic halophytes and algae is the Platamun cape at port Budva, and there predominates an E.Mediterranean phytobenthos. One presents here a preliminary coeno-taxonomical survey of the registered algal and halophytic communities with some notes on their synecology and distribution. For other details on the endemic Adriatic phytocenoses (= e), cf. Lovric (1978, 1981).

A) LITHOPHYLLETEA Giac. (circalittoral skiophytic phytobenthos),
Rhodymenietalia Boud. / Petroglossion Boud.,
1. Goniolitho-Lithophylletum trochantri Lov., exposed cliffs: Trašte - Budva.
- - - - - - - - / Rhodymenion Boud.,
2. Udoteo-Peyssonnellietum squamariae Mol., sea-caves: Trašte - Budva.
3. Zanardinio-Codietum bursae (Lov.)prov., deep screes: Trašte - Budva.
Lithophylletalia Giac. / Lithophyllion Giac.,
4. Crodelio-Halimedetum platydiscae Giac., deep cliffs: Trašte - Budva.

B) CYSTOSEIRETEA Giac. (infralittoral photophilic algae),
Ulvetalia Mol. / Ulvion Berner,
5. Cladostepho-Padinetum pavonicae (Zal.)Gam.& Span, shingles: frequent.
6. Arbacio-Lithophylletum incrustantis Boud., degraded rocks: frequent.
7. Pterocladio-Ulvetum rigidae (Bern.)Mol., polluted bays: Boka Gulf.
8. Chaetomorpho-Valonietum aegagrophilae Giac., overpolluted lagoons: Boka G.
Cystoseiretalia Mol. / Sargassion hornschuchii Giac.,
9. Cystoseiretum adriaticae-corniculatae Lov., stormy rocks (e): Trašte-Budva.
10. Cystoseiretum spinosae (Feld.)Giac., detritic bottoms: frequent in area.
- - - - - - - - / Cystoseirion crinitae Mol.,
11. Cystoseiretum barbatae (Zal.)Pign., sheltered rocks: Boka Kotorska Gulf.
12. Cystoseiretum crinitae Mol., open rocky bottoms: frequent in area.

Cystoseiretalia Mol. / Cystoseirion strictae Mol.,
13. Cystoseiretum spicatae-fimbriatae (Erc.)Lov, exposed shores (e): frequent.
14. Cystoseiretum amentaceae (Lorenz)Zal., overexposed shores: Trašte-Budva.

C) MELARAPHETEA Giac. (mediolittoral petricolous communities),
Microcoleetalia Golub. / Ulothrici - Bangion Hart.,
15. Fucetum virsoidis (Zal.)Pign., subsaline rocks (e): Risan Bay, very rare.
16. Catenelletum repentis (Lorenz)Zal., exposed caves: Trašte - Budva.
- - - - - - - - - / Enteromorphion intestinalis Hadač,
17. Enteromorphetum prolifero-intestinalis (Zal.)Hart., polluted: Boka Gulf.

Hyelletalia Erc. / Neogoniolitho - Nemodermion Mol.,
18. Hildenbrandtietum prototypi (Feld.)Giac., brackish caves: Boka Gulf.
19. Neogonolitho-Lithophylletum tortuosi Mol., exposed cliffs: Trašte - Budva.

D) ZOSTERETEA Pign. (seagrass meadows in the soft bottoms of salt waters),
Cymodoceetalia Lov. / Posidonion oceanicae (Br.Bl.) Mol.,
20. Cymodoceetum nodosae Giac.& Pign., degraded bottoms: frequent in area.
21. Posidonietum oceanicae (Lorenz)Mol., open bays: Trašte, Budva, Sutomore.

Zosteretalia (Bég.)Tx. / Zosterion marinae Christ.,
22. Zosterelletum noltii (Vouk)Giac., degraded lagoons: Boka Gulf.
23. Zosteretum marinae (Boerg.)Harm., subsaline bottoms: Boka Gulf.

Ruppietalia Tx. / Ruppion maritimae (Br.Bl.) Tx.,
24. Coleogeto-Zannichellietum maritimae (Hart.)Soo, subsaline pools: rare.

E) SALICORNIETEA Br.Bl. (crassulescent halophytes in the salt marshes),
Thero-Salicornietalia Br.Bl. / Salicornion strictae (Br.Bl.) Tx.,
25. Salicornietum europeae Wend., polluted salt marshes: Boka Gulf, Ulcinj.

Arthrocnemetalia (Br.Bl.)Tx. / Arthrocnemion fruticosi Br.Bl.,
26. Arthrocnemetum fruticosi Br.Bl., salt marshes: Tivat Bay.

Limonietalia Br.Bl.& Bol. / Halo - Artemision Pign.,
27. Limonio-Artemisietum caerulescentis Hić., salt swamps: Tivat Bay.

F) JUNCETEA MARITIMI Br.Bl. (subsaline swamps),
Bolboschoenetalia Soo / Bolboschoenion maritimi (Br.Bl.)Soo,
28. Bolboschoenetum maritimi Br.Bl., subsaline coastal swamps: Boka Gulf.

Juncetalia maritimi Br.Bl. / Juncion maritimi Br.Bl.,
29. Juncetum maritimo-acuti Hic., subsaline coasts: Boka Gulf, Ulcinj swamp.

G) AMMOPHILETEA Br.Bl.& Tx. (psammophytes in sand dunes and shingle beaches),
Cakiletalia (Tx.)Oberd. / Euphorbion peplis Tx.,
30. Euphorbio-Glaucietum flavi Hic., shingle beaches: frequent in fragments.

Ammophiletalia Br.Bl. / Ammophilion Br.Bl.,
31. Agropyretum mediterraneae (Kühn.)Br.Bl., internal dunes: Igalo, Ulcinj.
32. Ammophiletum australis Lak., external exposed dunes: Ulcinj beach, rare.

H) CRITHMO-LIMONIETEA Br.Bl. (xero-halophytes at the rocky seashores),
Crithmo-Limonietalia Mol. / Crithmo - Limonion (Mol.) Br.Bl.,
33. Plantagini-Limonietum anfracti (Birks)Ilij., rocks (e): Trašte - Budva.

J) CRASSO-EUPHORBIETEA Goday & Boria (succulent and summer-deciduous scrub),
Euphorbietalia dendroidis Zoh. / Aurinio - Capparion Lov. (e),
34. Ephedro-Cyathoselinetum palmoidis Lov, sea-cliffs (e): Trašte - Budva.
- - - - - - - - - - / Thymelaeion hirsutae Tadr.,
35. Euphorbietum dendroidis Guin.& Drou., abrupt coasts: Trašte - Sutomore.

K) NERIO-TAMARICETEA Br.Bl.& Bol. (subtropical swampy and coastal scrub),
Nerio-Tamaricetalia Br.Bl.& Bol. / Imperato - Erianthion Br.Bl.,
36. Arundino-Typhetum australis Lov, coastal swamps: Tivat, Budva.
- - - - - - - - - - - / Nerion oleandri Zoh.,
37. Andropogoni-Nerietum oleandri Djakon., wet rocks, very rare: Risan Bay.
- - - - - - - - - - / Tamaricion parviflorae Karp.,
38. as.Rubus dalmatinus-Vitex agnus-castus Lak., bays (e) : frequent.
39. Vitici-Tamaricetum dalmaticae (Hic)Lov, shingle beaches (e): Sutomore.
40. Tamarici-Salicetum amplexicaulis Karp., coastal swamps: Tivat, Budva.

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