NEW RECORDS OF MARINE RED ALGAE FROM THE AZORES

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ARQUIPÉLAGO

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We report ten subtidal, benthic marine red algae as new distribution records for the Azores: *Scinaia turgida*, *Cryptonemia lomation*, *Grateloupia* sp., *Acrosymphyton purpuriferum*, *Predaea feldmannii*, *Nemastoma confusa*, *Schimmelmannia ornata*, *Corynomorpha prismatica*, *Hypnea arbuscula*, and *Chrysymenia bullosa*. Each of these species is predominantly known from the tropical eastern Atlantic (West Africa) or from the Mediterranean.

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Registaram-se dez novas ocorrências de algas marinhas vermelhas bentónicas subtidais para os Açores: *Scinaia turgida*, *Cryptonemia lomation*, *Grateloupia* sp., *Acrosymphyton purpuriferum*, *Predaea feldmannii*, *Nemastoma confusa*, *Schimmelmannia ornata*, *Corynomorpha prismatica*, *Hypnea arbuscula* e *Chrysymenia bullosa*. A distribuição de qualquer destas espécies está referida predominantemente para o Atlântico oriental tropical (Oeste de África) ou para o Mediterrâneo.

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INTRODUCTION

Since the pioneering studies of SCHMIDT (1931) and FELDMANN (1946), the Azores have recently undergone a phycological revival of sorts, with interest focusing primarily on phytogeographic studies. FELDMANN (1946) characterized the marine algal flora of the Azores as being "boreal" and "poor" in species. More recently, van den Hoek (1984) categorized the Azorean archipelago in the warm temperate region of the northeast Atlantic. SOUTH & TITTLEY (1986) incorporated all recognized Azorean species in a taxonomist list of all known algae of the North Atlantic Ocean. PRUD'HOMME VAN REINE (1988) noted that the Azores, compared to the other Macaronesian archipelagos, are distinguished by a relatively low total number of algal species, i.e., 189 taxa (114 Rhodophyta, 41 Phaeophyta, 35 Chlorophyta), thus corroborating FELDMANN's (1946) observation on the paucity of the algal flora.

Using cluster analysis to study the relationship of the Azorean marine flora to the surrounding Atlantic areas, PRUD'HOMME VAN REINE (1988) found the Azorean marine flora to be intermediate between that of the subtropical Macaronesian islands (Canaries, Madeira and the Salvages) and those of the cooler warm- temperate Eurafrican coasts and the western Mediterranean, with the relative number of strictly warm-temperate species in the Azores being low compared to that of the Macaronesian islands and the Eurafrican temperate coasts. Further, PRUD'HOMME VAN REINE (1988) noted that the number of Azorean endemics is not very different from that in other areas except the western Mediterranean, a region of high endemism, and that North American species reported in the Azores also occur on the Eurafrican coasts. The predominance of species with a known tropical distribution as found in the marine flora of the Cape Verde islands (PRUD'HOMME VAN REINE & VAN DEN HOEK 1988) and to a lesser degree in that of Macaronesian islands, was noted to be lacking in the Azores, supporting van den HOEK's (1984) concept of the warm-temperate nature of the marine

flora (PRUD'HOMME VAN REINE 1988). A numerical analysis by TITTLEY & al. (1990) suggested closer affinities of the Azorean seaweeds with the North American (Virginian) flora.

In an updated checklist of the Chlorophyta from the Azores, FRALICK & HEHRE (1990) added 5 new records of subtidal species known to occur in the Mediterranean and/or in subtropical/tropical amphi-atlantic waters. Herein we add ten previously unreported red algal species to the marine flora of the Azores.

MATERIAL

Preliminary determinations of the marine Rhodophyta of the Azores collected in the islands of Faial, Pico, São Jorge, Terceira and São Miguel during the 1990 Harbor Branch Oceanographic Institution Expedition [HBOI], Division of Biomedical Marine Research [DBMR] were made on board of the Research Vessel R/V "Sea Diver", July 28-August 21, 1990. Vouchers for chemical analysis are deposited at HBOI, Fort Pierce, Florida. Specimens for systematic studies are fixed and preserved in 5% Formalin-seawater, temporarily housed at the Smithsonian Marine Station at Link Port, FL, and will be deposited in the Algal Collection of the US National Herbarium, Smithsonian Institution, Washington D.C. All specimens were collected subtidally by means of SCUBA. Abbreviations of collectors are Suzanne Fredericq (SF), Ester Serrão (ES), John Reed (JR), H. Ashburn (HA), and F. Koehn (FK). The new distribution records are identified as follows, and a general literature reference is given after each record. All are new distributional records for the Azores.

RESULTS

Chaetangiaceae

1 - *Scinaia turgida* Chemin, 1926

Faial: -31 VII 90, N coast, Ponta do Salão [38° 38.00'N; 28° 40.00'W], depth: 15-20 m, HBOI/DBMR sample #31-VII-90-2; SF, ES, JR.
São Jorge: -01 VIII 90, N coast, Ponta da Caldeira [38° 37.75'N; 27° 55.90'W], depth: 12 m, cystocarpic, HBOI/DBMR sample # 1-VIII-90-1-109; SF, ES, JR.
Pico: -03 VIII 90, S shore, E of Ponta dos Biscoitos [38° 24.30' N; 28° 10.80'W], depth: 15-30 m, HBOI/DBMR sample #3-VIII-90-1; SF, ES, JR.

Reference: This species has been previously reported from the northeast Atlantic and the western Mediterranean (CINELLI & CODOMIER 1973, GALLARDO & al. 1985, SOUTH & TITTLEY 1986).

Cryptonemiaceae

2 - *Cryptonemia lomation* (Bertolini) J. Agardh, 1851

São Miguel: -07 VIII 90, NW coast, 0.7 mile S of Ponta dos Mosteiros
[37° 53.40'N; 25° 49.63'W], depth: 10 m, cystocarpic, HBOI/DBMR sample #7-VIII- 90-1-103; SF, ES. -08 VIII 90, N coast, Porto de Capelas, NW part of Ponta do Morro [37° 50.69'N; 25° 41.28'W], depth: 23 m, HBOI/DBMR sample # 8-VIII-90-1; SF, ES. -08 VIII 90, N coast, Porto de Capelas, shore W of Port, [37° 50.60'N; 25° 41.68'W], depth: 10 m, HBOI/DBMR sample #8-VIII-90-2; SF, ES.

Reference: It has been reported from the Mediterranean and Canary Islands (GIL RODRIGUEZ & AFONSO-CARILLO 1980, GALLARDO & al. 1985) and Madeira (LEVRING 1974).

3 - *Grateloupia* sp.

São Miguel: -07 VIII 90, NW coast, 0.7 mile S of Ponta dos Mosteiros [37° 53.40'N; 25° 49.63'W], depth: 10 m , HBOI/DBMR sample #7-VIII-90-1-103; SF, ES. -07 VIII 90, NW coast, Ilhéu dos Mosteiros, E side [37° 53.38'N; 25° 50.05'W], depth: 20 m, HBOI/DBMR sample #7-VIII-90-4; ES, JR.
We recognize these specimens to be a *Grateloupia*, but more material is needed before it can be identified to species.

Corynomorphaceae

4 - *Corynomorpha prismatica* (J. Agardh) J. Agardh, 1872

São Miguel: -07 VIII 90, NW coast, 0.7 mile S of Ponta dos Mosteiros [37° 53.40'N; 25° 49.63'W], depth: 10 m, HBOI/DBMR sample #7-VIII-90-1; SF, ES.

Reference: This species has been recorded from tropical West Africa and the Indian Ocean (BALAKRISHNAN 1958, LAWSON & JOHN 1987).

Gloiosiphoniaceae

5 - *Schimmelmannia ornata* Schousboe *in* Kützing, 1849

Faial: -31 VII 90, N coast, Ponta do Salão [38° 38.00'N; 28° 40.00'W], depth: 15-20 m, HBOI/DBMR sample #31-VII-90-2; SF, ES, JR.
São Jorge: -01 VIII 90, N coast, Ponta da Caldeira [38° 37.75'N; 27° 55.90'W], depth: 12 m, cystocarpic, HBOI/DBMR sample #1-VIII-90-1-104; SF, ES, JR.
Pico: -02 VIII 90, S shore, E of Ponte de São João [38° 25.50'N; 28° 24.25'W], depth: 15 m, HBOI/DBMR sample #2-VIII-90-3; SF, ES, JR.

Reference: Previously *S. ornata* has been known only from the Atlantic coast of France (SOUTH & TITTLEY 1986).

Gymnophloeaceae

6 - *Predaea feldmannii* Børgesen, 1950

Faial: -31 VII 90, NE coast, Ponta do Pesqueiro [38° 36.60'N; 28° 36.80'W], depth: 20-23 m, cystocarpic, HBOI/DBMR sample #31-VII-90-1-105; SF, ES, JR. -31 VII 90, N coast, Ponta do Salão [38° 38.00'N; 28° 40.00'W], depth: 15-20 m, HBOI/DBMR sample #31-VII-90-2; SF, ES, JR.
Pico: -03 VIII 90, S shore, E of Ponta dos Biscoitos [38° 24.30'N; 28° 10.80'W], depth: 15-30 m, HBOI/DBMR sample #3-VIII-90-1; SF, ES, JR.
Terceira: -04 VIII 90, S shore, Angra da Heroísmo, middle of Port [38° 38.80'N; 27° 12.90'W], depth: 18 m, cystocarpic, HBOI/DBMR sample #4-VIII-90-1; JR, HA.

Reference: Recorded from St. Helena and tropical West Africa (KRAFT & JOHN 1976, LAWSON & JOHN 1987), it is now known to occur in the Azores.

7 - *Nemastoma confusum* Kraft & John, 1976

Faial: -31 VII 90, N coast, Ponta do Salão [38° 38.00'N; 28° 40.00'W], depth: 15-20 m, cystocarpic, HBOI/DBMR sample #31-VII-90-2; SF, ES, JR.
Pico: -03 VIII 90, S shore, Calheta de Nesquim, wall and rock outcrop W of Port [38° 23.80'N; 28° 04.45'W], depth: 20 m, HBOI/DBMR sample #3-VIII-90-3; SF, ES, JR.
São Miguel: -07 VIII 90, NW coast, 0.7 mile S of Ponta dos Mosteiros [37° 53.40'N; 25° 49.63'W], depth: 10 m, HBOI/DBMR sample #7-VIII-90-1; SF, ES.
-07 VIII 90, NW coast, Ilhéu dos Mosteiros, E side [37° 53.38'N; 25° 50.05'W], depth: 20 m, HBOI/DBMR sample #7-VIII-90-4; ES, JR.

Reference: Previously recorded from tropical West Africa (KRAFT & JOHN 1976, LAWSON & JOHN 1987).

Acrosymphytaceae

8 - *Acrosymphyton purpuriferum* (J. Agardh) Sjøstedt, 1926

Faial: -31 VII 90, N coast, Ponta do Salão [38° 38.00'N; 28° 40.00'W], depth: 15-20 m, cystocarpic, HBOI/DBMR sample #31-VII-90-2-102; SF, ES, JR.
Terceira: -05 VIII 90, S coast, Ilhéus das Cabras, NW tip and channel of W island [38° 38.00'N; 27° 09.00'W], depth: 23 m, cystocarpic, HBOI/DBMR sample #5-VIII-90-1-101g; JR, FK. -05 VIII 90, E coast, Praia da Vitória, inside S. Jetty from tip to 50 m south [38° 43.40'N; 27° 03.05'W], depth: 20 m, HBOI/DBMR sample #5-VIII-90-3; SF, ES, JR. -06 VIII 90, E coast, Praia da Vitória, N Jetty at tip [38° 43.55'N; 27° 03.05'W], depth: 20-30 m, cystocarpic, HBOI/DBMR sample #6-VIII-90-3-104; SF, ES, JR.
São Miguel: -07 VIII 90, NW coast, 0.7 mile S of Ponta dos Mosteiros [37° 53.40'N; 25° 49.63'W], depth: 10 m, HBOI/DBMR sample #7-VIII-90-1; SF, ES.

Reference: Recorded from the Mediterranean, Madeira (LEVRING 1974) and Canary Islands (GIL-RODRIGUEZ & AFONSO CARRILLO 1980, GALLARDO & al. 1985, LINDSTROM 1987) it is now reported from the Azores.

Hypneaceae

9 - *Hypnea arbuscula* P. Dangeard, 1952

Faial: -29 VII 90, SE coast, near Horta, Baía do Porto Pim, Ilhéu Negro [38° 31.33'N; 28° 38.00'W], depth: 10-15 m, HBOI/DBMR sample #29-VII-90-1; SF, ES, JR.
Pico: -02 VIII 90, S shore, E of Ponta de São João

[38 25.50'N; 28 24.25'W], depth: 15 m, HBOI/DBMR sample #2-VIII-90-3; SF, ES, JR.

Reference: New to the Azores, it has previously been recorded from tropical and subtropical West Africa (LAWSON & JOHN 1987).

Rhodymeniaceae

10 - *Chrysymenia bullosa* Levring, 1974

Faial: -02 VIII 90, S shore [38° 30.50'N; 28° 40.20'W], depth: 50 m, dredge, HBOI/DBMR sample #2-VIII-90-2.

Reference: Recorded from Madeira Archipelago (LEVRING 1974, AUDIFFRED & PRUD'HOMME VAN REINE 1985), it is now known from the Azores.

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