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THE ALGAE OF KAPINGAMARANGI ATOLL, CAROLINE ISLANDS. PART I.
CHECKLIST OF THE CYANOPHYTA, CHLOROPHYTA AND PHAEOPHYTA

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THE ALGAE OF KAPINGAMARANGI ATOLL, CAROLINE ISLANDS. PART I. CHECKLIST OF THE CYANOPHYTA, CHLOROPHYTA AND PHAEOPHYTA

by Jan Newhouse^{1/}

Kapingamarangi, identified with the Carolines although several degrees south of the main group, was the site of the fifth Coral Atoll Expedition^{2/} team project of the Pacific Science Board in 1954. Other reports of the work carried out during the ten-week stay on the atoll have been made by Wiens (1956), Niering (1956) and McKee (1956). It is unfortunate that the results of the algal studies have been so long delayed but these are presented now in the belief that this postponement has not detracted from the value of observations and conclusions made at the time of and since the expedition.

In order to obtain an understanding of the algae, four lines of field study were followed.

1. Extent of recognition and use of algae.

Questioning revealed that the people made no direct use of any alga and, although aware of specific differences, there were no names for the various taxa. Aside from recognizing that Halimeda segments contributed to lagoon sediments, the people revealed no knowledge or interest in the roles of algae within the atoll area.

2. Biological roles of the algae.

Very limited investigations of these suspected roles could be made during the stay on the atoll. Intertidal beach rock was collected for its blue-green alga content. The distribution of intertidal molluscs, believed to be in part responsible for the decomposition of beach rock, was checked and notes were taken on the repopulation of cleared areas. Collections of these snails were made for stomach contents and these, together with the distributional notes, have revealed clues as to the role of blue-green algae in the decomposition of intertidal beach rock.

It was noted that encrusting coralline algae (Porolithon sp.) coated and bound individual coral growths on the seaward reef margins.

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3. Studies of marine associations with other team members.

Each member of the field party actively cooperated in several of the team projects and helpful suggestions were freely exchanged on different phases of the summer's work. Particular emphasis was given to the study of selected transects by Dr. Cadet Hand, Dr. Robert Harry, and the writer. A patch reef was mapped with the help of Dr. Harold Wiens, and Dr. William Niering handled the terrestrial organisms on the transects that cut across islets. Biological and geological features were plotted and collections were made of the algae for determination. Supplementary photographs were taken from an aerial platform of three of the transects; a patch reef, a reef flat opposite an islet, and a reef flat extending from seaward to lagoon margins were completely photographed from as nearly a vertical position as practical. Mr. Edwin McKee dredged samples of algae and invertebrates that extended these reef studies into deeper water.

A number of marine associations were recorded and it is expected that these may be characterized in such a way that they will be useful for comparison with other atolls and coral reefs. It was to this end that the greater part of the time on the atoll was devoted.

4. Collection of specimens.

Optical equipment supplied by the Botany Department of the University of Hawaii made possible the examination of fresh algal material as it was collected. The ability to check microscopic characters while in the field was a great aid in the understanding of the transect areas. Use of the equipment also restricted the need for preserving quantities of unknown and, hence, perhaps duplicate material.

There is still considerable effort needed in assembling and interpreting data from these different studies. For this reason, it seems advisable to make available a checklist of those algae already determined and devote another paper to the descriptive and interpretive aspects. All members of the Cyanophyta, Chlorophyta and Phaeophyta have been given final determinations, as have many of the Rhodophyta. These latter will, however, be included in the second paper.

CYANOPHYTA

The names used here are in agreement with the synonymy proposed by Drouet and Daily (1956) and Drouet (1962, 1963 and 1964). Dr. Drouet kindly provided many of the determinations and the collection numbers are those of the author.

Anacystis aeruginosa (Zanard.) Dr. & Daily 1481

Calothrix crustacea Thur. 1186, 1189, 1395, 1484, 1652

Calothrix pilosa Harv. 1655, 1656

Coccochloris stagnina Spreng. 1640

- Dichothrix bornetiana Howe 1262
- Entophysalis conferta (Kütz.) Dr. & Daily 1254, 1454, 1493, 1499,
1535, 1658
- Entophysalis deusta (Menegh.) Dr. & Daily 1185a, 1461a, 1494, 1498b,
1500c, 1636a, 1637, 1643a, 1651, 1652a, 1659
- Hormothamnion enteromorphoides Grun. 1167, 1411
- Hydrocoleum coccineum Gom. 1012, 1125, 1219, 1367, 1397, 1475a,
1530, 1548, 1663
- Hydrocoleum glutinosum (Ag.) Gom. 1241, 1473a
- Hydrocoleum lyngbyaceum Kütz. 1133, 1483, 1662
- Lyngbya confervoides Ag. 1056, 1075a, 1166, 1320, 1338, 1415, 1438,
1493a, 1496, 1497, 1614
- Lyngbya gracilis Rabenh. 1482
- Lyngbya lutea (Ag.) Gom. 1320
- Lyngbya majuscula (Dillw.) Harv. 1013, 1165, 1177
- Lyngbya sordida (Zanard.) Gom. 1014, 1051, 1055, 1078, 1108, 1121,
1162, 1164, 1203, 1222, 1564
- Mastigocoleus testarum Lagerh. 1498, 1636, 1643b
- Microcoleus chthonoplastes (Mert.) Zanard. 1500a, 1501
- Microcoleus tenerimus Gom. 1473, 1500d, 1656a
- Nostoc (commune ?) sp. 1635a
- Oscillatoria amphibia Ag. 1644a
- Oscillatoria chalybea Mert. 1644
- Oscillatoria margaritifera Kütz. 1500b
- Phormidium penicellatum Gom. 1116, 1145, 1216, 1329, 1334, 1366,
1515, 1552, 1633, 1660
- Porphyrosiphon notarisii (Menegh.) Kütz. 1623
- Rivularia polyotis (Ag.) Born. & Flah. 1072, 1345
- Schizothrix calcicola (Ag.) Gom. 1081, 1185, 1283, 1461, 1475,
1476, 1489, 1495, 1498a, 1638, 1643, 1652b, 1659a
- Schizothrix longiarticulata Gardner 1638b

Scytonema hofmannii Ag. 1130, 1131, 1571, 1634, 1635, 1638a, 1640a,
1641

Scytonema mirabile (Ag.) Born. 1657

Sirocoleum kurzii (Zell.) Gom. 1475b

Spirulina subsalsa Oerst. 1186a, 1287, 1663a

Symploca hydroides Kütz. 1058, 1079, 1157, 1410, 1488, 1502

CHLOROPHYTA

Dr. Paul Silva and Dr. Edwin Moul provided the Codium and Halimeda determinations respectively. The late Dr. E. Yale Dawson confirmed those of the other taxa.

Acetabularia parvula Solms-Laubach 1382, 1398

Anadyomene wrightii Gray 1117, 1146, 1290, 1553, 1576

Avrainvillea amadelpha Gepp 1027, 1074, 1086, 1109, 1140, 1213,
1289, 1330, 1405, 1509, 1550, 1572, 1583, 1585, 1607, 1649

Boodlea composita (Harvey) Brand 1176, 1464

Boodlea vanbosseae Reinbold 1010, 1011, 1091, 1310, 1335

Bryopsis indica A. & E. S. Gepp 1622

Bryopsis pennata Lamouroux 1270

Bryopsis plumosa (Huds.) Ag. 1426

Caulerpa ambigua Okam. 1214

Caulerpa antoensis Yamada 1000, 1021, 1097, 1132, 1175, 1226, 1268,
1608, 1646

Caulerpa racemosa (Forsskål) J. Ag. 1020, 1044, 1113, 1159, 1173,
1174, 1206, 1249, 1264, 1387, 1599, 1600, 1601

Caulerpa serrulata (Forsskål) J. Ag. 1018, 1096, 1128, 1236, 1250,
1388, 1517

Caulerpa urvilliana Montagne 1001, 1019, 1040, 1136, 1208, 1368,
1459, 1516

Caulerpa verticillata J. Ag. 1385

Cladophora sp. 1279, 1543

- Codium arabicum Kütz. 1143
- Codium geppii O. C. Schmidt 1017b, 1054, 1269, 1506
- Derbesia minima W. van Bosse 1059, 1168, 1419
- Dictyosphaeria bokotensis Yamada 1170
- Dictyosphaeria cavernosa (Forssk.) Borg. 1043, 1094, 1099, 1456,
1575
- Dictyosphaeria mutica Yamada 1325, 1335, 1359
- Enteromorpha prolifera (Muller) J. Ag. 1252, 1275, 1300, 1332, 1448,
1486, 1586
- Halimeda cylindracea Decaisne 1028, 1034, 1101, 1582
- Halimeda discoidea Decaisne 1515a, 1529
- Halimeda fragilis Taylor 1030, 1100b, 1102, 1210, 1266, 1296,
1519, 1556, 1579, 1591
- Halimeda incrassata (Ellis) Lamouroux 1577, 1602a
- Halimeda lacunalis f. lacunalis Taylor 1103, 1422, 1512, 1613
- Halimeda lacunalis f. lata (Taylor) Hillis 1022
- Halimeda micronesica Yamada 1007, 1023, 1035, 1104, 1225, 1371,
1510, 1521, 1592, 1593
- Halimeda opuntia v. hederacea (Barton) Hillis 1017a, 1029, 1237,
1578, 1602, 1645
- Halimeda opuntia v. opuntia (L.) Lamouroux 1008, 1015, 1024, 1031,
1041, 1042, 1100a, 1298, 1417, 1518, 1580, 1581, 1603, 1604, 1605
- Halimeda stuposa Taylor 1016, 1301, 1400
- Halimeda taenicola Taylor 1009, 1036, 1105, 1106, 1107, 1223, 1224,
1297, 1370, 1520, 1570, 1590
- Microdictyon okamuri Setchell 1085, 1194, 1263
- Microdictyon pseudohapteron A. & E. S. Gepp 1193
- Neomeris sp. nov. ? 1161
- Neomeris vanbosseae Howe 1006, 1069, 1123, 1255, 1288, 1361, 1598
- Protoderma sp. 1440, 1477, 1485
- Rhipidophyllon reticulatum (Ask.) Heydr. 1063, 1169, 1184a, 1399

Rhizoclonium hieroglyphicum (J. Ag.) Kütz. 1144, 1424

Siphonocladus rigidus Howe 1120, 1156, 1285, 1562

Ulothrix sp. 1526

Valonia aegagropila Ag. 1075b, 1220, 1350

Valonia utricularis Ag. 1077, 1088, 1197, 1563

Valonia ventricosa J. Ag. 1087, 1114, 1391, 1514

PHAEOPHYTA

Dictyota friabilis Setchell 1014a, 1239, 1276, 1389, 1433, 1455,
1629

Dictyota patens J. Ag. 1066, 1541

Ectocarpus indicus Sonder 1436

Ectocarpus mitchellae Harvey 1630

Padina commersonii Bory 1014b, 1057, 1112, 1129, 1160, 1240, 1423

Pocockiella variegata (Lamouroux) Papenfuss 1005, 1060, 1067,
1070, 1141, 1155, 1163, 1191, 1221, 1242, 1247, 1256, 1267, 1351,
1416, 1427, 1431, 1450, 1528, 1545

Sphacelaria novae-hollandiae Sonder 1429, 1437, 1449, 1503

Turbinaria ornata (Turn.) J. Ag. 1083, 1142, 1620, 1648

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