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New records of Halimeda and Udotea for the Pacific area

by

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New records of Halimeda and Udotea

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Edwin T. Moul^{1/}

The collections of Halimeda and Udotea reported here constitute new records for the Pacific area. Knowledge of the distribution of these genera for the Pacific Ocean is far from complete, so the publication of these records will help to fill the gaps.

Time for the study was made possible through the aid of a Faculty Fellowship granted by the Research Council of Rutgers-The State University. The facilities and library of the Marine Biological Laboratory at Woods Hole, Massachusetts were made available through the courtesy of the Laboratory Management.

The nomenclature used is that of the monograph by Hillis (1959). The collections reported here were made by the following people:

J. T. Conover	1945-46	Guam, Saipan, Okinawa
Leonard Horwitz	1951	Arno, Marshall Islands
F. R. Fosberg	1951-52	Northern Marshall Islands
Maxwell Doty	1952	Raroia, Tuamotu Archipelago
	1953	Johnston Island, and Philippines
W. J. Newhouse	1954	Kapingamarangi, Caroline Islands
E. J. Kuenzler	1956	Okinawa

Specimens have been distributed to the following herbaria: University of Hawaii, Honolulu; United States National Herbarium, Washington, D. C.; Chrysler Herbarium, Rutgers-The State University, New Brunswick, N. J.; and University of California Herbarium, Berkeley. Some duplicates have been sent to New York Botanical Garden, Bronx, N. Y.; W. R. Taylor, University of Michigan, Ann Arbor, and L. W. Hillis at Yale University.

Arno Atoll, Marshall Islands

(Pacific Science Board Expedition - 1951)

This collection, including 9 species of Halimeda, was made by Leonard Horwitz, whose collection numbers identify the specimens.

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Halimeda lacunalis Taylor

On lagoon reef flat and on the downward slope to a depth of 30 feet.
Ine Village: MD 9084, 15 July.

Halimeda lacunalis Taylor f. lacunalis

On upper and lower surfaces of rock in 20-30 feet of water, downward slope beyond lagoon reef ridge.
Ine Village: MD 9076B, MD 9076C, 15 July.

Halimeda discoidea Decaisne

Growing on the drop-off of lagoon reef, not deeper than 10 feet at high tide. Shaded by overhanging rocks and corals.
Ine Village: 9720B, 27 Aug.

Halimeda taenicola Taylor

On lagoon reef flat and the downward slope of lagoon reef. Shaded by coral or rocks in some cases.
Ine Village: 9072C, 9072D, 10 July; 9577, 9599, 17 Aug.; 9675, 9676, 9683, 22 Aug.

Halimeda opuntia (L.) Lam. v. opuntia

Hillis (1959) has placed the typical species and its many integrated forms in v. opuntia. It was pointed out by Moul (1959) that frequently one described growth form suddenly changed to another on the same plant, therefore the placing of these forms here seems logical.

Found on lagoon flat and downward slope beyond lagoon reef ridge to 30 feet. Also on ocean reef flat and in drop off on ocean side to 15 feet. In crannies and under rocks and corals, frequently shaded. Material collected from the ocean reef, individual segments very small, 3-4 mm wide by 4-5 mm long.

Ine Island: 9072A, 9072B, 9072F, 10 July; 9084D, 15 July; 9161, 27 July; 9162, not dated; 9359, 6 Aug.; 9471, 10 Aug.; 9525, 9526, 9528, 9529, 9530, 14 Aug.; 9546, 9547, 9549, 15 Aug.; 9577A, 17 Aug.; 9548, 9674, 22 Aug.; 9720C, 27 Aug.

At the inshore end of a long chasm, ocean reef.
Kabinlak Island: 9094, 20 July.

Halimeda fragilis Taylor

On lagoon reef drop off.
Ine Village: 9673, 22 Aug.

Halimeda micronesica Yamada

Beyond and below the ocean reef ridge, on rock mass in 30 feet of water.

Eduk Island: 9034, 7 July.

Downward slope of lagoon reef ridge in 20-30 feet of water.

Ine Village: 9076A, MD 9084B, MD 9084G, 15 July.

Sheltered area at low water mark in a chasm of the ocean reef ridge.

Kabinlak Island: 9093, 20 July.

Halimeda incrassata (Ellis) Lam.

All in 20-30 feet of water on downward slope, beyond lagoon reef ridge.

Ine Village: MD 9084C, MD 9084E, MD 9084F, 15 Aug.

Halimeda cylindracea Decaisne

On lagoon reef flat or downward slope to a depth of 30 feet. One collection from over the edge of the reef on the ocean side of the island.

Ine Village: 9072G, 10 July; 9084H, 15 July; 9161B, 27 July; 9675B, 22 Aug.

Halimeda stuposa Taylor

On lagoon reef flat.

Ine Village: 9043, 9072E, 10 July.

Sandy floor of lagoon reef.

Matol-en Islet: 9492, 12 Aug.

Northern Marshall Islands 1951-1952

The algae recorded here were collected on the United States Geological Survey Expedition "Project Atoll", 1951-1952, which visited the Northern Marshall Islands. The narration of the trip and a description of the atolls visited have been written by Fosberg (1955) who made the algal collections.

Halimeda lacunalis Taylor f. laxa (Taylor) Hillis

On the southwest reef, in cavities in the upper surface of coral clumps on the deeper part of the reef flat. Plants truncated at the coral surface.

Bikar Atoll: Bikar Islet, 34554A, 7 Aug. 1952.

Halimeda taenicola Taylor

On the deepest part of the reef flat, on gravel covered by a thin layer of sand.

Ailuk Atoll: Ailuk Islet, 33919, 26 Dec. 1951.

On the seaward reef flat, near the outer edge, just below low tide level.

Kwajalein Atoll: Lojjaviok Islet, 34113, 15 Jan. 1951.

In small holes in the surface of the leeward reef in the lagoon, just exposed at low tide.

Pokak Atoll: Sibylla Islet, 34537, 26 July 1952.

First two collections from cavities in the deeper part of the reef flat; third in a moat on the outer side of the ridge, exposed to wave action.

Bikar Atoll: Bikar Islet, 34554B, 34560, 7 Aug. 1952.
Jalikklik Islet, 34585, 9 Aug. 1952.

Halimeda opuntia (L.) Lam. v. opuntia

In crevices between rocks in the deepest part of the channel, at extreme low tide mark, passage east of Enemanet Islet.

Lae Atoll: Enemanet Islet, 34085, 10 Jan. 1952.

On the sandy and rocky bottom of the reef flat and between coral clumps, below low tide level.

Ujae Atoll: Bock Islet, 34349, 19 Feb. 1952.
Wojia Islet, 34389A, 4 March 1952.

A bleached specimen was collected in the wash along the beach.

Wotho Atoll: Eneobnak Islet, 34443, 20 March 1952.

In small holes on the leeward reef in the lagoon, just exposed at low tide.

Pokak Atoll: Sibylla Islet, 34536, 26 July 1952.

Halimeda micronesica Yamada

From small holes in the leeward reef in the lagoon, just exposed at low tide, with H. opuntia and H. taenicola.

Pokak Atoll: Sibylla Islet, 34535, 26 July 1952.

Halimeda stuposa Taylor

On the bottom of the lagoon at the end of the South passage.

Likiep Atoll: Lado Islet, 33837, 15 Dec. 1951.

Common on the sandy bottom of the lagoon, below high tide level. The holdfast was deeply embedded in the sand of the reef flat.

Ujelang Atoll: Ujelang Islet, 34190, 4 Feb. 1952.

Common on the sandy bottom at extreme low tide level.

Wotho Atoll: Wotho Islet, 34224, 12 Feb. 1952.

Along the lagoon beach with H. opuntia.

Ujae Atoll: Wajia Islet, 34389B, 4 March 1952.

Udotea argentea Zanardini f. typica A. & E. S. Gepp

Embedded in coral sand and gravel at the bottom of the lagoon.

Likiep Atoll: Lado Islet, 33833, 15 Dec. 1951.

On the reef flat with Halimeda taenicola; the substrate, sand covered gravel or Porites coral.

Ailuk Atoll: Ailuk Islet, 33920, 26 Dec. 1951; 33948, 33949, 33950, 33951, 27 Dec. 1951.

Udotea indica A. & E. S. Gepp

On rock floor of the reef flat near the outer edge.

Ailuk Atoll: Ailuk Islet, 33982, 28 Dec. 1951.

Raroia (Barclay de Tolley) Atoll

Tuamotu Archipelago

(Pacific Science Board Expedition - 1952)

Only 2 species of Halimeda were in the collection of Maxwell Doty and W. J. Newhouse from Raroia Atoll. Doty reports (1954) that no living Halimeda were dredged from the bottom of the lagoon, but the sides of reef patches were clothed with this genus and Caulerpa.

Halimeda discoidea Decaisne

Large well developed plants growing on coral patches in 10 feet of water. Plants from 12 to 30 cm tall.

Jakeke and Obreroa Islets: 11159, 9 July; 11498, 2 Aug.; 11636, 8 Aug.

All small, depauperate plants, growing in holes on inside edge of lagoon reef. One in hole of boring urchin.

Kukina and Ngarumaoa Islets: 11231, 18 June; 11804, 16 Aug.; 12154, 3 Sept.

Halimeda taenicola Taylor

Outer reef puka, incurrent area in overgrown surge channel.

12162, 3 Sept.

Philippine Islands

Collected by Maxwell S. Doty on the east shore of Paniquian Island, Puerto Galero, Mindoro.

Halimeda opuntia (L.) Lam. v. opuntia

Plants with very small segments.
12345, 2 Dec. 1953.

Halimeda macroloba Decaisne

12346, 2 Dec. 1953.

Johnston Island

Collected by Maxwell S. Doty, north of northeast end of seaplane runway.

Halimeda tuna (Ellis and Solander) Lam.

10993, 4 Dec. 1953.

Hawaiian Islands

Collected by Maxwell S. Doty and W. J. Newhouse at Kailua beach on Oahu.

Halimeda gracilis Harvey ex J. Agardh

Washed onto the beach. Plants straggling and decumbent.
12423, 13 March 1954.

Kapingamarangi Atoll, Caroline Islands

(Pacific Science Board Expedition - 1954)

This collection of 9 species, was made by W. J. Newhouse, whose collection numbers identify the specimens.

Halimeda lacunalis Taylor f. lacunalis

In lagoon of the atoll, at 2-10 feet; all on coral with one exception, this growing to 35 cm long, at 2 feet depth, in a rusted LCM.

1103, 8 July; 1422, 3 Aug.; 1512B, 7 Aug.; 1613, 14 Aug.

Halimeda lacunalis Taylor f. lata (Taylor) Hillis

On the sea reef opposite Touhou, 5 meters from the seaward margin.
1022, 28 June.

Halimeda discoidea Decaisne

In 6 feet water at low tide on branching coral, lagoon reef.
1515, 7 Aug.

In 10 feet water in a cavern of a micro-atoll.
1529, 7 Aug.

Halimeda taenicola Taylor

The macroscopic appearance of this taxon varies considerably, but the arrangement of nodal filaments and the presence of three layers of utricles with the third layer the largest in diameter, is common to all of the specimens represented.

On the seaward reef, over the edge in 10 feet of water, in the channels of the reef and on reef flat in Amphiroa zone. Also in lagoon, in shaded areas on coral mesas, micro-atolls and coral heads, from 2 to 10 feet of water.

1009, 24 June; 1036, 29 June; 1105, 1106, 1107, 8 July; 1223, 1224, 21 July; 1520, 7 Aug.; 1570, 9 Aug.; 1590, 12 Aug.

Halimeda opuntia (L.) Lam. v. opuntia

In the lagoon at low tide level to 10 feet. On seaward reef in the Amphiroa zone, plants with very small segments.

1008, 24 June; 1015, 25 June; 1024, 28 June; 1031, 1042, 29 June; 1100, 8 July; 1518, 7 Aug.; 1580, 1581, 11 Aug.; 1603, 1604, 1605, 12 Aug.

Halimeda opuntia (L.) Lam. v. hederacea (Barton) Hillis

This variety has larger segments and is very heavily calcified. Plants resembling these and placed in this variety were common on Onotoa, Gilbert Islands (Moul, 1959).

Mostly in the lagoon at 4-15 feet. Two specimens from western rim of atoll on lagoon side of seaward reef at 5 feet.

1017, 26 June; 1029, 29 June; 1237, 21 July; 1578, 11 Aug.; 1602, 12 Aug.; 1645, 19 Aug.

Halimeda fragilis Taylor

In lagoon at 2½-15 feet, most of them pendulous or under overhangs on corals or micro-atolls.

1030, 20 June; 1100B, 1102, 8 July; 1266, 22 July; 1519, 7 Aug.; 1556, 9 Aug.; 1579, 11 Aug.; 1591, 12 Aug.

Halimeda micronesica Yamada

In lagoon at 4-10 feet, on base of corals, coral mesas, or micro-atolls, frequently on shaded underside. Three specimens on seaward reef, on the margin and over the edge at 10 feet.

1007, 24 June; 1023, 28 June; 1035, 29 June; 1104, 8 July; 1225, 21 July; 1510, 1521, 7 Aug.; 1592, 1593, 12 Aug.

Halimeda incrassata (Ellis) Lam.

In lagoon, one plant at 15 feet, on base of branching coral; a second, small specimen at 4 feet with H. opuntia on a coral mesa.

1577, 11 Aug.; 1602B, 12 Aug.

Halimeda cylindracea Decaisne

On lagoon reef, to 15 feet, around bases of massive corals. In channels between islands at 2 feet. Plant 1034, collected on June 30th, covered with gametangia.

1028, 29 June; 1034, 30 June (gametangia); 1101, 8 July; 1528, 11 Aug.

Halimeda stuposa Taylor

In lagoon on sand flats; one plant from western rim of atoll. Usually in shallow water, but found to 6 feet. One plant only 7½ cm tall had a massive holdfast, 10½ cm long by 5½ cm broad.

1016, 26 July; 1301, 27 July; 1400, 3 Aug.

Guam

The four species of Halimeda reported here for Guam were collected by J. T. Conover in 1945.

Halimeda lacunalis Taylor

On sandy bottom near shore and on coral blocks in shallow water. Abundant.

Agat Bay: 50 yards east of Neye Island. 720, 8 April.

Halimeda opuntia (L.) Lam. v. opuntia

On sandy bottom near shore and on coral shelf, midreef.

Asan point: 3002, 14 Jan.; 3001 (760), 2 Feb.; 727, 21 March.

Halimeda cylindracea Decaisne

In shallow water, midreef on sandy bottom.

Agat Bay: Near Neye Island. 706, 8 April.

Halimeda macroloba Decaisne

In shallow water, sandy bottom, on coral fringe reef. Plant 401, collected on Feb. 5th, was covered with gametangia.

Tumon Bay: Near Amantes Point. 3000, 3 Jan.; 401 (gametangia), 5 Feb.

Pago Bay: 741, 16 Feb.

Saipan

One specimen of Halimeda from Saipan was included in J. T. Conover's material for 1945.

Halimeda macroloba Decaisne

Abundant in shallow water. Sandy bottom in basins between coral heads, within inner reef barrier and on open coral flats seaward one mile on the 3 mile reef area.

Tanapag Harbor: 757, 22 April.

Okinawa

The collections reported were made by J. T. Conover in 1945-46, and E. J. Kuenzler in 1956.

Halimeda discoidea Decaisne

Very young, fragmentary plants. Conover 3004, 20 Aug. 1945.

Halimeda opuntia (L.) Lam. v. opuntia

Conover 3003, 20 Aug. 1945.

Halimeda opuntia (L.) Lam. v. hederacea (Barton) Hillis

In tide pool on coral shelf, ¼ mile off shore.

Onno Peninsula: Conover 781, 10 July 1945.

Halimeda incrassata (Ellis) Lam.

On sandy bottom in 4 feet of water, to 200 yards seaward.

Kanna Ko: Conover 790, 20 Sept. 1945.

On coral flats, shallow water.

Nago: Conover 850, 19 March 1946.

Sand and coral intertidal zone.

Bolo Point: Kuenzler 186, 187, 188, 29 Aug. 1956.

Halimeda simulans Howe

On coral sill of shore reef.

Yonanaru: Conover 796, 8 Oct. 1945.

On gently sloping sand and coral beach.

Bolo Point: Kuenzler, 148, 149, 150, 185, 19 Aug. 1956;
198, 199, 30 Aug. 1956.

In 4-10 feet water, sandy area between scattered coral rocks.

Lolly Beach: 121, 15 July 1956.

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