

***Dictyota* Lamouroux (Dictyotales, Phaeophyceae) of the Fiji and Solomon Islands.**

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Abstract

This paper deals with the identification of six species of *Dictyota* Lamouroux. *Dictyota dentata*, *D. patens* and *D. divaricata* are new records to the Fiji Islands. And, *D. bartayresii* is a new record to the Solomon Islands.

Introduction

Though there are several reports of algal flora of Fiji, only three species of *Dictyota* are known. Grunow (1873) reported two varieties of *D. dichotoma* (Hudson) Lamouroux (var. *elongata* Kützing and var. *implexa* (Desf.) Gray = var. *intricata* (Agardh) Grev.) from Ovalou Island. These two varieties were recognized from Suva and the coasts of Viti Levu Island by Chapman (1971). In the additional list, Kapraun and Bowden (1978) reported *D. bartayresii* Lamouroux from Lauthala Bay near Suva, and *D. cervicornis* Kützing from Rambi, Vanua Levu Island.

On the other hand, Womersley and Bailey (1970) reported two species: *D. friabilis* Setchell and *D. hamifera* Setchell in the Solomon Islands.

The species treated in this paper are the collection of Dr. Hiroshi Itono & Mr. Tetsuro Ajisaka (1st expedition) and present authors (2nd expedition) during the Scientific Survey of the South Pacific by Kagoshima-maru, Kagoshima University.

Collection sites in the Fiji and Solomon Islands were shown in the maps of preliminary reports (Itono & Ajisaka 1982, Enomoto & Ajisaka 1983).

Specimens are now deposited at Herbarium of Fishery Resources, Division of Tropical Agriculture, Kyoto University.

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Key to species of *Dictyota* Lamouroux from Fiji and Solomon

1. Branching alternate *D. dentata*
1. Branching subdichotomous or dichotomous2
 2. Margin serrated *D. patens*
 2. Margin entire, proliferation may be present at basal portion3
3. Thallus spirally twisted *D. cervicornis*
3. Thallus not spirally twisted4
 4. Angle of branching less than 100°5
 4. Angle of branching broad, 90-130° *D. divaricata*
5. Thallus small, less than 2 cm *D. friabilis*
5. Thallus larger than 2 cm *D. bartayresii*

1. *Dictyota dentata* Lamouroux (Fig. 1, A-C)

Kützing 1859: 566, tab. 35, fig. 1; Okamura 1913: 115, pl. 129, figs 1-4; Taylor 1960: 224, pl. 30, figs. 4 & 5.

Thallus robust, erect, bushy, up to 13 cm tall, greenish-brown in colour; distinctly alternate branching with one of each pair of branching usually shorter than the other; margin entire; segments 1.5-4.0 mm broad, the tips obtuse, acute, erose-dentate or spinulose; angles of branching 60-90°.

Epidermal cells square, 16-20 μm wide and long from surface view; internal cells seen easily through the surface of lower portion, 40-50 μm broad, 50-70 μm long.

Sori of hair absent.

Tetrasporangia scattered on both surfaces of the thallus, globular, 80-100 μm in diameter.

This species is restricted to the terraces beyond the reef margin, 3 to 20 meters deep in Fiji.

Specimens examined. Fiji: Kadavu Isl., Ndravuni Isls., A32, A43, Jan. 7, 1982, Itono & Ajisaka; Makuluva Isl. St. 2, A62-89, Nov. 30, 1982, Enomoto & Ajisaka.

2. *Dictyota patens* J. Agardh (Fig. 1, D & E)

Okamura 1913: 15, pl. 104, figs. 1-11; Dawson 1954: 401, fig. 16 c; Tsuda 1972: 96, pl. 4, fig. 4.

Thallus prostrate, greenish-brown to dark brown, more than 6 cm tall, flat, membranous; subdichotomous branched; margin furnished with minute teeth or processes, which often grew up into proliferous leaflets; segments 2-4 mm broad, the tips obtuse; angles of branching 45-75°.

Epidermal cells rectangular, 10-16 μm wide and 30-40 μm long from surface view; internal cells large rectangular, 76-110 μm broad and 132-160 μm long.

Compact sori of hair scattered all over the surface of both sides, elliptical, 70-80 μm wide and 90-120 μm long.

This specimen sterile.

Specimen examined. Fiji: Makuluva Isl. St. 2, A19, Jan. 8, 1982, Itono & Ajisaka.

3. *Dictyota cervicornis* Kützing (Fig. 1, F & G)

Kützing 1859 : 11, tab. 24, fig. 2 ; Taylor 1960 : 222, pl. 31, fig. 2 ; Jaasund 1970 : 75, figs. 2-H & 3-B ; Tsuda 1972 : 95, pl. 3, fig. 4 ; pl. 4, fig. 1.

Thallus up to 14 cm tall, bushy, attached by stupose holdfast, coloured light to dark brown ; branched irregularly dichotomous ; margin entire, some proliferations on the old portions ; segments slender, to 1.5 mm broad, membranous, twisted ; the tips obtuse or acute, sometimes spur-like ; angles of branching 60-90°.

Epidermal cells rectangular, 15-18 μm wide and 27-45 μm long from surface view ; internal cells seen easily through the surface, 40-88 μm broad and 160-240 (400) μm long.

Compact sori of hair scattered on the surface of both sides, round or elliptical, 80-100 μm wide and 80-130 μm long.

These specimens sterile.

This species is common in Fiji, entangled with other algae or substratum on the reef edge. The segments are variable in broad even in a same specimen.

Specimens examined. Fiji : Makuluva Isl. St. 2, A 2-10, A29, 30, Jan. 2 and 3, 1982 ; Suva, Entrance of Harbor St. 6, A28, 36, 42, Jan. 4, 1982 ; Suva, Reef of I. M. R. St. 5, A40, Jan. 8, 1982, Itono & Ajisaka ; Nukumbutho Isl. St. 3, A16, Nov. 26, 1982 ; Malevu, Singatoka St. 5, Nov. 28, 1982, Enomoto & Ajisaka.

4. *Dictyota divaricata* Lamouroux (Fig. 1, H & I)

Okamura 1913 : 31, pl. 108, figs. 1-8 ; Taylor 1960 : 221, pl. 31, figs. 3 & 4 ; Jaasund 1970 : 76, figs. 1-F, 2-E & 3-E ; Tsuda 1972 : 96, pl. 4, fig. 2.

Thallus small, up to 1 cm tall, brown to dark brown in colour, liniar ; branching regularly dichotomous ; margin entire, some proliferations on the basal portion ; segments slender, 0.1 to 0.3 mm broad throughout ; the tips acute ; angles of branching broad, 90-130°.

Epidermal cells rectangular, 10-14 μm wide and 16-18 μm long from surface view ; internal cells not seen from the surface.

Sori of hair absent.

Tetrasporangia scattered over the both surfaces of the thallus except margins, globular, 40-48 μm in diameter.

Specimen examined. Fiji : Malevu, Singatoka St. 5, A57, Nov. 28, 1982, Enomoto and Ajisaka.

5. *Dictyota friabilis* Setchell (Fig. 1, J)

Setchell 1926 : 91, pl. 13, figs. 4-7 ; pl. 20, fig. 1 ; Dawson 1954 : 401, figs. 16 a & b ; Womersley and Bailey 1970 : 290 ; Jaasund 1970 : 75, figs. 2-D & 3-D ; Tsuda 1972 : 96, pl. 4, fig. 3.

Thallus prostrate, up to 2 cm long, brown in colour, flat, membranous, friable, often in compact clumps ; irregularly dichotomous branched ; margin entire, sometimes proliferous on the basal portions ; bundles of marginal rhizoids along the edges ;

segments 1-2 mm broad, tapering to the base, the tips obtuse, acute or spinulose ; angles of branching 45-100°.

Epidermal cells rectangular, 16-20 μm wide and 20-40 μm long from surface view ; internal cells seen easily through the surface of lower portion, 100-140 μm broad and 160-200 μm long.

Sori of hair absent.

Tetrasporangia scattered along the middle portion of the both surfaces of the thallus, globular, 40-70 μm in diameter.

Specimens examined. Solomon : Guadalcanal Isl., Honiara, Kukum St. 1 and 2, A127-151, Dec. 6, 1982 ; Honiara, Kukum St. 3, A152-156, Dec. 7, 1982, Enomoto & Ajisaka.

6. *Dictyota bartayresii* Lamouroux (Fig. 1, K & L)

Taylor 1960 : 219, pl. 30, fig. 2 ; Jaasund 1970 : 72, figs. 1-D, 2-C & 3-C ; Tsuda 1972 : 95, pl. 3, figs. 2 and 3 ; Egerod 1974 : 150, fig. 80.

Thallus erect or prostrate, 4-6 cm tall, greenish-brown to dark brown in colour, flat, membranous, sometimes loosely clumped ; dichotomous branched ; margin entire or with some minute teeth along the margin ; sometimes teeth grew up into proliferous leaflets ; bundles of marginal rhizoids along the edges ; segments 1-4 mm broad throughout, the tips obtuse or acute ; angles of branching 45-100°.

Epidermal cells rectangular, 20-30 μm wide and 30-90 μm long from surface view ; internal cells seem easily through the surface of lower portion, 80-140 μm broad and 120-180 μm long.

Compact sori of hair scattered on the surface of both sides of the thallus, round to elliptical, 100-120 μm in diameter.

These specimens sterile.

Specimens examined. Fiji : Makuluva Isl. St. 2, A1, A23-26, Jan. 2, 1982 ; Suva, Reef of I. M. R. St. 5, A21 and A31, Jan. 8, 1982, Itono & Ajisaka ; Makuluva Isl. St. 1, A12, A45, A48-53, A91, Nov. 26, 1982 ; Nukumbutho Isl. St. 3, A44, Nov. 26, 1982 ; Malevu, Singatoka St. 5, A46, A47, A54-56, Nov. 28, 1982, Enomoto & Ajisaka. Solomon : Tulaghi Isl., Frorida Isls. St. 4, A101-126, Dec. 8, 1982, Enomoto & Ajisaka.

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Explanations of figures

Fig. 1. *Dictyota* species of the Fiji and Solomon Islands. A & B: Habits of *D. dentata* Lamouroux (A62 & A75), C: Undivided tetrasporangium of *D. dentata* (A72), D: Habit of *D. patens* J. Agardh (A19), E: Apical portion of *D. patens*, showing marginal teeth (A19), F & G: Habits of *D. cervicornis* Kützing (A7 & A16), H: Habit of *D. divaricata* Lamouroux (A57), I: Upper branch of *D. divaricata*, showing tetrasporangia on the middle portion (A57), J: Habit of *D. friabilis* Setchell (A134), K & L: Habits of *D. bartayresii* Lamouroux (A121 & A23).

