HALOPHILA DECIPIENS OSTENFELD F. — A NEW RECORD FROM THE EASTERN COAST OF INDIA

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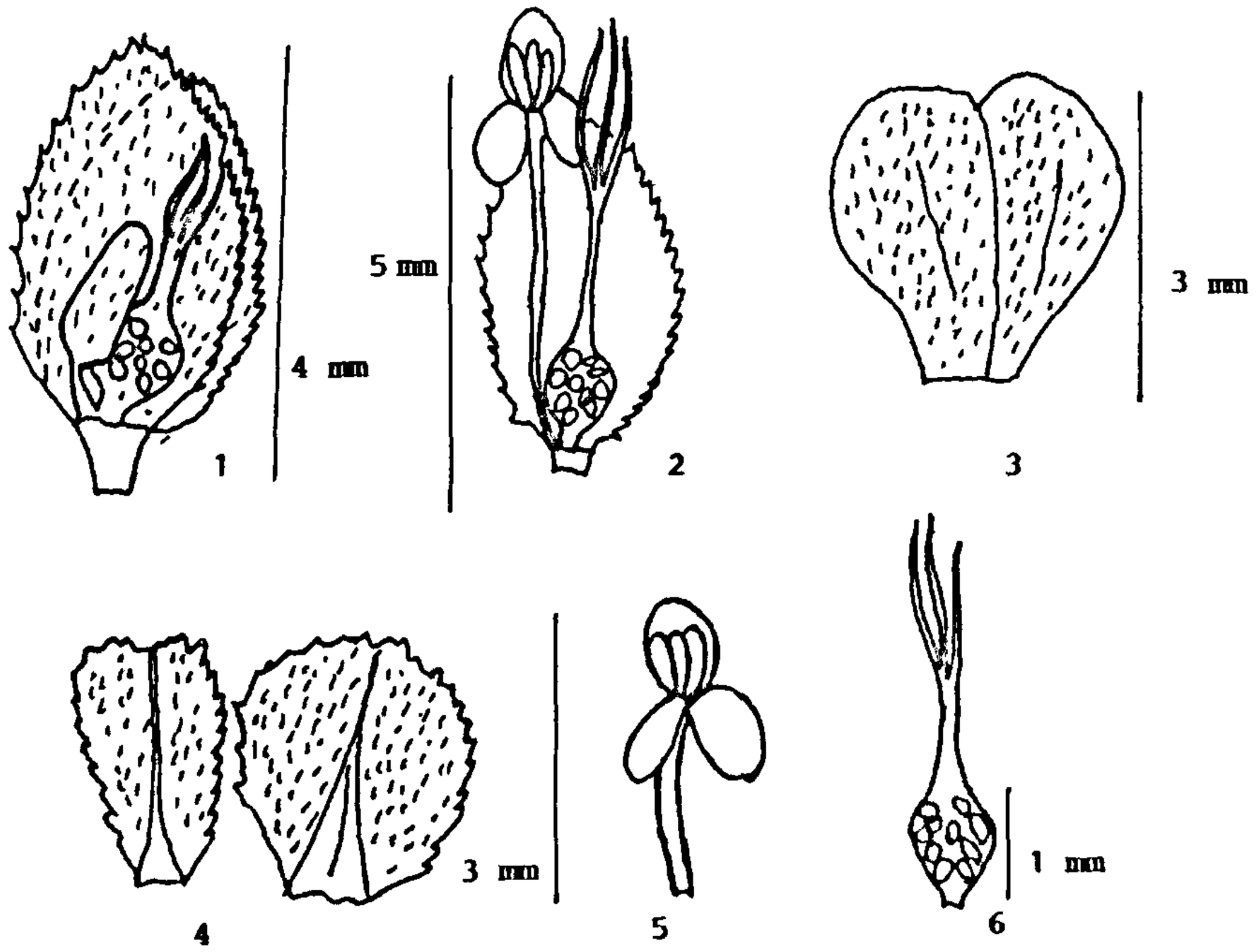
HALOPHILA DECIPIENS, the only pantropical species was collected by Dixit at Malwan near Bombay[1] (fruit 15.3.1923) and at Colaba, Bombay island (January 1928). After nearly 60 years of this record from the western coast, it is now reported for the first time from the east coast of India. The species is conspicuous in the ecosystem and in the shallow waters of Alankarathittu of Tuticorin. *H. ovata* Gaud in Freycin, *H. ovalis* (R.Br.) Hook. f., *H. stipulacea* (Forsk) Aschers and *H. beccarii* Aschers are the other species reported from Indian coasts.

Halophila decipiens Osten. f., Bot. Tiddskr. 24 (1920) 260, with fig., den Hartog, Fl. Males, I 5 (1957) 410–411, f. 18: den Hartog. The seagrasses of the world, (1970) 254–258. *H. decipiens* Osten. f. var. *pubescense* den Hartog, Fl. Males I 5 (1957) 411.

The diagnostic characters of all the species of *Halophila* occurring in India are given in table 1. Specimens of *H. decipiens* can be distinguished from other species by the smaller size of the plant, presence of hairs on both surfaces of the leaf, serrulate margin, monoecious and papillae on the three stigmas (figures 1–6).

Voucher specimens are deposited in the Herbarium, Department of Botany, Bharathiar University, Coimbatore.

The authors thank the Department of Environment, New Delhi for financial assistance.



Figures 1–6. *Halophila decipiens* Ostenfeld f. **1.** Young spathe; **2.** Mature spathe; **3.** Scale; **4.** Spathe leaves; **5.** Male flower; **6.** Female flower.

Table 1 *Diagnostic characters of species of Halophila*

H. ovalis	*H. ovata*	*H. decipiens*	*H. stipulacea*	*H. beccarii*
Dioecious Leaves 2, oblong-elliptic, surface glabrous, 1–7 cm long: 1/2–2 cm wide: margin entire: intramarginal cross veins 10–12 pairs	Dioecious Leaves 2, oblong-elliptic, glabrous; 7–14 mm long: 3–5 mm wide, margin entire, intramarginal cross veins 3–11 pairs	Monoecious Leaves 2, oblong-elliptic, surface rough with stiff unicellular hairs: margin finely serrulate, cross veins 4–9 pairs: 20–30 mm long and 6–10 mm wide	Dioecious Leaves 2, linear to oblong, glabrous, papillose or slightly hairy 3–6 cm long: 2½–8 mm wide, margin serrulate	Dioecious Leaves 6–10 on erect shoot: lanceolate, glabrous margin entire, 6–13 mm long: 1–2 mm wide, cross veins absent
Flowers unisexual	Flowers unisexual	Spathe encloses one male and one female flower	Flowers unisexual	Flowers unisexual

25 May 1987; Revised 14 October 1987

1. Hartog, C. den, *The seagrasses of the world*, North-Holland, Amsterdam, 1970, p. 254.

ALTERATION OF RIBULOSE BISPHOSPHATE CARBOXYLASE/OXYGENASE RATIO BY UREA

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RIBULOSE bisphosphate carboxylase/oxygenase (Rubisco) catalyses carboxylation and oxygenation of RuBP to initiate photosynthesis and photorespiration respectively. Carbon dioxide and oxygen are mutually competitive substrates in these reactions[1]. Modification of enzyme reactivity towards its alternate substrate might enhance plant productivity[2,3]. The question arises whether the activity of Rubisco can be modified. Efforts have been made to seek chemical agents which modify its activity. However, most of the apparent effects were the result of artifacts in the assay procedures used[4,5]. The present study by utilizing a sensitive assay procedure indicates that urea decreases the carboxylase/oxygenase ratio.

RuBP carboxylase/oxygenase was purified from spinach following the method of Jordan and Ogren[4]. Purified enzyme was preincubated with 10 mM $NaHCO_3$, 10 mM $MgCl_2$ with 25 mM tris (pH 8) and 0.25 mM EDTA for 1 h at 20°C. Assays were initiated by adding 70 μg of activated protein in 25 μl to reaction mixtures at 25°C containing varying amounts (0.5, 1, 2, 5, 10 mM) of $NaH^{14}CO_3$, 0.0236 mM H^3RuBP, 10 mM $MgCl_2$, 50 mM Bicine at pH 7.85, with and without 2 M urea in a total volume of 0.5 ml. Reactions were performed in 6 ml scintillation vials which were sealed with serum stoppers. The reaction mixtures were flushed with pure oxygen for 15 min before adding $NaH^{14}CO_3$ and enzyme. Reactions were terminated after 30 min by adding 0.1 ml of a solution containing 0.05 N HCl and 50 mM $ZnSO_4$ and stored at – 15°C.

Carboxylation and oxygenation rates were determined according to Jordan and Ogren[4]. The labelled products of carboxylase reaction [(^{3}H, ^{14}C) glycerate-P] and the oxygenase reaction (^{3}H-glycolate-P) were separated. Glycolate-P phosphatase was used to convert (^{3}H) glycolate-P to (^{3}H) glycolate which was readily separated from labelled organic phosphates by ion exchange chromatography. Radioactivity in these compounds was quantified by scintillation spectroscopy. The ratio of RuBP carboxylase/oxygenase was determined by measuring the two activities simultaneously in the same reaction mixture. This procedure eliminates the possible discrepancy when two activities were measured separately under different conditions particularly at low CO_2 concentration[4,5].

The ratio of carboxylase to oxygenase activity (vc/vo) plotted against the ratio of CO_2 and O_2 concentrations present during assay is shown in figure 1. The ratio increases with increase in the ratio of the CO_2 and O_2 concentrations. However, this ratio was lower when urea was included in the assay medium.