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PERSONAL AUTHORS - CATLING, H.D.
PARFITT, S.

CORPORATE AUTHORS - IRRI

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AN ILLUSTRATED DESCRIPTION OF A TRADITIONAL DEEPWATER RICE VARIETY OF BANGLADESH

H. D. CATLING AND S. PARFITT

The International Rice Research Institute
P.O. Box 933, Manila, Philippines

AN ILLUSTRATED DESCRIPTION OF A TRADITIONAL DEEPWATER RICE VARIETY OF BANGLADESH[1]

[1]By *H. D. Catling*, Deepwater Rice Pest Management Project, Bangladesh Rice Research Institute, and the Overseas Development Administration, Government of the United Kingdom (Present address: International Rice Research Institute, P.O. Box 2453, Bangsala, Thailand), and *Shirley Parfitt*, Food and Agriculture Organization of the United Nations (FAO), Dacca, Bangladesh. Submitted to the IRRI Research Paper Series Committee January 1981.

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AN ILLUSTRATED DESCRIPTION OF A TRADITIONAL DEEPWATER RICE VARIETY OF BANGLADESH

Chota Bawalia is typical of several hundred traditional deepwater rice varieties in Bangladesh. It is grown annually at water depths of 1.5-3.5 m on several thousands of hectares in the southern Dacca district on the lower Jamuna floodplain of central Bangladesh. The variety was studied from 1977 to 1980 in the Keraniganj area near Dacca (Catling et al 1980, Catling 1981, Catling and Alam 1981).

Farmers sow Chota Bawalia with the first good rains in April. During the preflood period, usually about 8 weeks, basal tillers are produced (Fig. 1b). Culm elongation begins with flooding in mid-June and nodal tillering takes place from late June to mid-August (Fig. 1c,d,e). Flowering, which is strongly induced by photoperiod, begins the first week of October. During the 4-year study, Chota Bawalia was harvested from 29 October to 1 November, which is 1-2 weeks earlier than many other leading varieties. Figure 1a-h shows the growth and development of the variety. Other details of its development, i.e. nodes and nodal roots, panicles, ripening, are in Figures 2, 3, and 4.

The flooding regime in a typical field of Chota Bawalia was studied. Water depth increased by 3-5 cm/day for the first 100 cm and 1-2 cm/day for the next 50 cm. In 1980, floodwater increased at a mean rate of 9 cm/day in a second surge of flooding between 11 and 27 August. Maximum seasonal water depths in August varied from 176 to 329 cm (av 227 cm). These flooding regimes did not seriously submerge Chota Bawalia but stand density was reduced. Nodal tillering was stimulated by 2 or 3 periods of stable or subsiding flood levels. Floodwater begins to recede in late August or early September and departs from the fields by the third week of October

Rainfall and farmers' weeding practices strongly influence Chota Bawalia's stand density in the preflood period. Stand density varied from 180 to 240 culms/m^2 before flooding; in July, after the first surge of flooding, it stood at 140-190 culms/m^2. By September it had decreased to 130-160 culms/m^2 at the water surface and there were only 100-110 panicles/m^2 at harvest in October. The decline in stand density was partly attributed to the attack of yellow rice borer *Tryporyza incertulas* (Walker) (Catling 1981).

Mean yields from 19 crop-cuts at Keraniganj over 4 years ranged from 1.7 to 3.7 t/ha (av 2.4 t/ha, c.v. = 20.5%); the yield exceeded 3 t/ha in 2 fields (Six other leading deepwater rice varieties outyielded Chota Bawalia in the crop-cut study.) Yields of Chota Bawalia were depressed as the maximum water depth approached 2.3 m. No fertilizer was applied to deepwater rice in this area and in most years only small amounts of silt are deposited. Fertility is provided by leguminous crops, which are grown widely in the winter off-season, and by a large complex of algae associated with the culms and nodal roots (Catling et al 1981).

Fig. 1. Growth and development of a deepwater rice plant, variety Chota Bawalia: (a) seedling stage, 2 leaves, plant length 20 cm, 9 May; (b) basal tillering stage, preflood period, main culm and basal tiller, length 43 cm, 26 May; (c) early elongation stage, main culm and basal tiller, length 110 cm, nodal tiller emerging, water depth 75 cm, 26 June; (d) elongation stage, main culm, basal tiller, and nodal tiller, length 175 cm, water depth 125 cm, 26 July; (e) full elongation stage, zigzagging of culms begins near water surface, length 250 cm, water depth 175 cm (maximum for season), 22 August; (f) kneeing begins, prepanicle initiation stage; now a denser, floating canopy; fully developed nodal roots; culm thickness (sheath removed) about 4.5 mm below major site of kneeing; water subsiding, depth 135 cm, 15 September; (g) booting stage, length 350 cm, water depth 120 cm, 21 September; (h) milk stage; all culms prostrate except the terminal sections holding up the ripening panicles above the mass of culms; nodal roots grow down into the soil at some places and late growth flushes of tillers, which are mostly nonproductive, may develop; water almost completely receded leaving puddles on heavy soils; length 350 cm, 15-20 October. NOTE: One main culm, one basal tiller, and one nodal tiller are shown throughout; normally many plants consist of only one or two culms and plants with more than three or four culms are atypical and are found only in poor stands or on the edges of a field.

Fig. 2. Nodes and nodal roots: (a) an upper node on the water surface supporting a shoot, a *knee*; (b) nodal roots developing just below the water surface; (c) well-developed nodal roots at a knee; (d) fully developed nodal root system below the water surface; a nodal tiller has developed from this node.

Fig. 3. Panicles: (a) advanced panicle emergence showing kneeing and terminal leaves; (b) mature panicle (weight 2.8 g).

Fig. 4. Ripening fields: (a) milk stage, panicles still mostly erect, (b) mature stage, showing the chaos of prostrate and semiprostrate panicles on the collapsed plant canopy.

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P.O. Box 933, Manila, Philippines

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