PANICLE SENESCENCE IN RICE

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BESIDES senescence of leaf, senescence of panicle is also a critical factor in grain filling in cereals including that of rice. Nakayama[1,2] studied in detail the pattern of panicle senescence in a *japonica* cultivar, *koshiji-wase* and emphasised the importance of delayed senescence of the rachille supporting the spikelets for proper grain filling. However, no such report was available on *indica* rices under tropical conditions so far.

Studies were undertaken during the 1980 wet season to assess the panicle senescence in 6 modern rice varieties belonging to early (*Pallavi, Ratna*); medium (*Vijaya, Jaya*) and late (*Jagannath, CR 1009*) groups. The relative partitioning of assimilates to panicle at harvest was also assessed. The senescence in various parts of the panicle *i.e.* rachis, rachille and grain was analysed by estimating the activity of succinic dehydrogenase enzyme[3]. Higher activity of the enzyme is taken as an index of delayed senesence[2]. Panicles of uniform emergence were tagged and samples were drawn at flowering, 7, 14, 21 days after flowering (DAF) and at harvest stage. The activity of succinic dehydrogenase enzyme in 100 mg fresh plant tissue was calculated as μg of triphenyl formazan (TPF) which is the reduction product of the dye 2-3-5, triphenyltetrazolium chloride. The partitioning of assimilates to panicles or partition index (PI) was measured as —(panicle dry weight per tiller/total dry weight per tiller) × 100.

In general, the activity of succinic dehydrogenase enzyme decreased in grain, rachis and rachille with progressive maturity of panicle (table 1). However, such decrease in the rachis and rachille occurred beyond 7 DAF in *Vijaya* and beyond 14 DAF in grains of the late types, *Jagannath* and *CR 1009*. The senescence in rachille was faster than in rachis and grain. Varieties, *Pallavi* (early), *Vijaya* (medium) and *Jagannath* (late) exhibited slower senescence in the panicle components (rachis, rachille and grain) than *Ratna, Jaya* and *CR 1009* in the respective groups. The former three varieties also exhibited greater partition index (PI) indicating that slower panicle senescence helps in efficient mobilisation of assimilates from shoot to panicle during the grain filling period.

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2. Nakayama, H., *Bull. Hokuriku Natl. Agric. Exp. Sta.*, 1974, **16**, 15.
3. Sato, O., *Exp. Methods on Biochem, Bunko-do*, Tokyo, 1953, p. 304.

TABLE I

Senescence of panicle in rice cultivars expressed as succinic dehydrogenase activity

Stages (S)	Varieties					
	Early		Medium		Late	
	V_1	V_2	V_3	V_4	V_5	V_6
(a) TPF/100 mg f. wt.						
Grain						
Flowering	1·05	0·56	0·65	0·64	0·25	0·24
7 DAF	0·88	0·47	0·64	0·61	0·38	0·33
14 DAF	0·73	0·38	0·56	0·41	0·41	0·38
21 DAF	0·66	0·36	0·44	0·36	0·15	0·21
Harvest	0·55	0·21	0·39	0·28	0·11	0·14
Mean	0·77	0·40	0·54	0·46	0·26	0·26
C. D. 5%						
Varieties (V)	0·012		0·017		N.S	
Stages (S)	0·020		0·027		0·017	
V × S	0·028		0·038		0·024	

Table 1 (contd.)

Rachille

Flowering	0·40	0·29	0·22	0·13	0·13	0·08
7 DAF	0·32	0·28	0·26	0·11	0·08	0·07
14 DAF	0·30	0·22	0·20	0·09	0·07	0·07
21 DAF	0·21	0·20	0·17	0·08	0·04	0·05
Harvest	0·11	0·06	0·08	0·07	0·04	0·04
Mean	0·27	0·21	0·19	0·10	0·07	0·06
C.D. 5						
Varieties (V)		0·014		0·013		0·007
Stages (S)		0·021		0·020		0·011
V × S		0·030		0·029		0·015

Rachis

Flowering	0·46	0·30	0·24	0·15	0·16	0·12
7 DAF	0·41	0·29	0·31	0·13	0·12	0·10
14 DAF	0·38	0·28	0·22	0·11	0·11	0·10
21 DAF	0·36	0·21	0·20	0·10	0·08	0·08
Harvest	0·30	0·17	0·19	0·10	0·06	0·07
Mean	0·38	0·25	0·23	0·12	0·10	0·09
C.D. 5%						
Varieties (V)		0·026		0·012		0·006
Stages (S)		0·046		0·019		0·009
V × S		0·057		0·027		0·013

(b) *Partition index (PI)*

Harvest	68·5	58·8	67·0	61·8	59·1	51·7
C. D. 5% Varieties (V)		2·37		0·28		0·45

V_1 = *Pallavi*, V_2 = *Ratna*, V_3 = *Vijaya*, V_4 = *Jaya*, V_5 = *Jagannath* V_6 = *CR* 1009, DAF = Days after flowering, V = Variety, S = Stage.

ISOLATION OF A NEW STRAIN OF *STREPTOMYCES ALBUS* FROM AGRA SOILS

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ABOUT 300 actinomycete cultures were isolated in pure form from soil samples collected from different localities of Agra region, adopting dilution plate technique[1] on Thronton's agar medium[2]. During their screening for obtaining antibiotic producing strains an actinomycete (isolate No. k-32) was found to be strongly antagonistic to *Colletotrichum falcatum* (Went) causing red-rot in sugarcane and to *C. gloeosporioides* (Penz) causing anthrocnose in mango, and, leaf spots and anthracnose on citrus, papaya, sugarcane etc. and also to other micro-organisms including gram positive and gram negative bacteria and fungi of different taxonomic groups including some of the important plant pathogens. The screening was done by placing the plugs, cut from a 10-day old cultures of actinomycetes, in the petri plates previously seeded with test organisms.

The actinomycete is non-chromogenic type, forming compact growth on agar media. The whole cell hydrolysates contain LL diamenopimelic acid. Sporophores are open spirals, spores in chains, are spherical to oval with smooth surface configuration as seen under electron microscope. The isolate k-32 was placed in section Spira and White Series[3].

The antibiotic substance produced by isolate k-32 is thermolabile. It can be stored without any loss in activity up to 48 days at low temperature (5° C) and neutral reaction. It is best soluble in *n*-butanol, methanol and distilled water. The antibiotic activity is not suggestive of polyene antibiotics. the IR spectrum of antibiotic substance indicates the presence of −OH,