Effects of pure and mixed plantation of *Eucalyptus camaldulensis* Dehnh. and *Albizia procera* (Roxb.) Benth. on their growth and biomass yield

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There has been a long-standing concern about the ecological stability of single species plantation, in particular the risk of yield reduction and deterioration in site quality or of catastrophic outbreaks of insects and diseases. There is a continuing research into the use of mixtures to promote ecological stability in stands and to reduce the risk of massive failure. But there are still very few documented instances of species mixtures enhancing both total and specific yield of a crop. Therefore, an experiment was conducted in the Institute of Forestry and Environmental Sciences, University of Chittagong, Chittagong, Bangladesh to study the effects of pure and mixed plantation of *Eucalyptus camaldulensis* Dehnh. and *Albizia procera* (Roxb.) Benth. on their growth and biomass yield. The treatments consisted two pure planting plots 100% *E.* (P_0) and 100% *A.* (P_1) and three mixed planting plots 50% *E*: 50% *A* (M_1), 75% *E*: 25% *A* (M_2) and 25% *E*: 75% *A* (M_3). Four-month-old seedlings were transplanted to the field from the nursery. Measurements taken after a growth period of 14 months in the field showed that in comparison to pure plantations, mixed plantations had relatively better growth in height, collar dia, crown length, crown dia and biomass yield.

Table I: Stem height, collar diameter, crown length, and crown diameter of individual tree in pure and mixed plantations fourteen months after transplanting.

Treatment	Stem ht. (m)	Collar dia (cm)	Crown length (cm)	Crown dia (cm)
Eucalyptus camaldulensis				
P_0	2.5cd	2.1c	82.5d	67.5d
M_1	4.5a	4.4a	179.7a	128.7bc
M_2	4.2ab	4.2a	144.4abc	121.6bc
M_3	3.5bc	2.4bc	133.3bc	111.8c
Albizia procera				
P_1	2.0d	2.0c	92.0d	97.6cd
M_1	2.6cd	2.9bc	109.6cd	119.3bc
M_2	2.5cd	3.1bc	121.4bcd	147.2ab
M_3	3.3bc	4.1ab	159.6ab	168.8a

Means followed by the same letter (s) in the same column are not significantly different according to Duncan' s Multiple Range Test ($P<0.05$).

Table II: Biomass productivity of individual tree in pure and mixed plantation fourteen months after transplanting

	Fresh Weight (g)	Air-dry Weight (g)

Eucalyptus camaldulensis	Stem	Root	Leaf	Total	Stem	Root	Leaf	Total
P_0	401.7e	256.7c	183.3c	841.7e	113.3e	81.8c	43.3d	238.4d
M_1	2876.6a	1030.4a	576.7ab	4483.7a	1085.5a	316.7a	163.5ab	1565.7a
M_2	2436.7a	846.6ab	596.8ab	3680.1ab	900.4ab	233.4ab	174.0ab	1307.8ab
M_3	596.8de	366.8c	233.4c	1197.0de	240.0e	144.4bc	58.7d	443.1cd
Albizia procera	553.4de	228.3c	196.7c	978.4e	195.7e	102.3c	72.5cd	370.5cd
P_1	1416.8bc	713.4b	496.5b	2626.7bc	518.6cd	230.7ab	129.7bc	879.0b
M_1	925.3cd	420.3c	605.0ab	1950.6cd	330.4de	159.6bc	190.3ab	680.3bc
M_2	1780.5b	778.6b	686.7a	3245.8b	633.4bc	298.4a	211.6a	1143.4ab
M_3								

Means followed by the same letter (s) in the same column are not significantly different according to Duncan' s Multiple Range Test ($P<0.05$).

Table III: S/R Ratio and Quality Index of individual tree in pure and mixed plantation fourteen months after transplanting

Eucalyptus camaldulensis	S/R Ratio	QI
P_0	1.9	17.3
M_1	3.9	110.5
M_2	4.6	89.6
M_3	2.1	26.6
Albizia procera		
P_1	2.7	29.4
M_1	2.8	74.2
M_2	3.3	60.1
M_3	2.8	105.1