INFLUENCE OF REED BAMBOO *(OCHLANDRA TRAVANCORICA)* ON SOILS OF THE WESTERN GHATS IN KERALA – A COMPARATIVE STUDY WITH ADJACENT NON-REED BAMBOO AREAS

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Introduction

Ochlandra travancorica is the most common and widely spread species of reed bamboo in the Western Ghats region of Kerala, occurring as an undergrowth in natural forests as well as pure patches of impenetrable thickets. The soils on which *Ochlandra travancorica* is distributed are mainly Ultisols and Inceptisols (Sujatha, 1999). Reed colonization improves physical properties of soil (Thomas and Sujatha, 1992) and it is an ideal species for growing under older teak plantations of Kerala for improving the health of degrading lateritic soils (Sujatha *et al.*, 2003). Having established well on a particular soil, just like any vegetation, it also exerts significant impact on the soil, which can be morphological, physical, chemical and/or biological. Soil improvement with respect to pH, exchangeable Ca, Mg and K was reported by Pant *et al.* (1993) due to the growth of bamboo. But such changes in soil characteristics exerted by reed bamboo have not been evaluated so far especially in relation to adjacent non-reed bamboo areas which do not differ in climate, elevation and topography and hence this study was undertaken.

Study Area and Methods

The State of Kerala, located at the South-western corner of Peninsular India enjoys tropical climate. The annual rainfall of the State, especially the Western Ghats region, varies from 2,500 mm in the South to about 5,000 mm in the North. Predominantly reed growing areas of the State viz., Vazhachal, Pooyamkutty and Pamba (Fig.1) were selected for this study.

The area occupying pure reed brakes, selected at Vazhachal, was a moderately sloping land with northern aspect and situated at an elevation of about 550 m amsl. The adjacent non-reed area was an open land with some moist deciduous tree seedlings and grasses.

At Pooyamkutty, the reed tract selected was at about 450 m elevation and the adjacent non-reed area was occupied by a degraded moist deciduous forest. Both vegetations were on steeply sloping land with southern aspect. At Pamba, the selected reed patch was at 600 m amsl and the adjacent non-reed area was a moist deciduous forest. The landscape was moderately sloping with northern aspect.

Typical soil profiles were struck in reed growing and adjacent non-reed areas and these profiles were examined for various morphological properties as per Soil Survey Staff (1992). In addition to the samples from the genetic horizons of the soil profiles, 15 soil samples (0-15 cm) from each vegetation at random were also collected. Various physical and chemical properties viz., gravel, texture, bulk density, water holding capacity, pH, organic carbon, exchange acidity and exchangeable bases were determined using standard procedures (Jackson, 1958; Black *et al.,*1965). Comparison of means of various surface soil properties was made using Students 't' test.

Results and Discussion

Site and morphological features of soil profiles in reed and adjacent non-reed areas : The profile-wise morphological features of the soils of reed growing and adjacent non-reed areas are highlighted in Table 1. Profiles 1, 2 and 3 represent pure reed brakes and 4, 5 and 6 represent adjacent non-reed areas at Vazhachal, Pooyamkutty and Pamba respectively. As revealed in Table 1, soils of pure reed growing tracts at all the sites were characterised by abundant litter on surface which was under varying degrees of decomposition. The major portion of the fine fibrous roots occupied the surface layer and functioned like a thick mat. It was also observed that in pure reed brakes, where upper canopy was closed, undergrowth was completely absent. This is thought to be due to the prevention of sunlight by the closed canopy and inhibition of regeneration of other species by the root mat of reed.

Table 1

Soil profile morphology of reed and adjacent non-reed areas

Profile No. 1
Site features :

Middle of a hill at Vazhachal, elevation 550 m asl, northern aspect, pure reed patch, closed canopy, no undergrowth and abundant litter on soil surface.

Depth (cm)	Horizon	Characteristics
0-6	A1	Dark brown (7.5 YR 3/4), sandy loam, crumb and granular structure, loose, non-plastic, abundant roots, presence of partly decomposed litter.
6-62	A2	Brown (7.5 YR 5/4), sandy loam, crumb and granular, friable, non-plastic, abundant roots and big stones.
62-80	Bw1	Brown (7.5 YR 5/4), gravelly sandy clay loam, massive, loose, non-plastic, plenty of roots.
80-108	Bw2	Brown (7.5 YR 4/3), sandy clay loam, massive, loose, non-plastic, no roots.
108-126+	Bw3	Brown (7.5 YR 4/3), sandy loam, massive, loose, plastic, presence of weathering pieces of rocks.

Contd...

Profile No. 2
Site features :

Valley of a hill at Pooyamkutty, pure reed patch, closed canopy, no undergrowth, very near to water course, abundant litter on soil surface, plenty of exposed rocks.

Depth (cm)	Horizon	Characteristics
0-4	A	Dark brown (7.5 YR 3/4), sandy loam, crumb, loose, non-plastic, abundant roots, presence of partly decomposed litter.
4-48	Bw	Strong brown (7.5 YR 4/6), sandy loam, crumb, loose, non-plastic, abundant roots, presence of big stones.
48+	C	Weathered rock.

Profile No. 3
Site features :

Lower middle of a hill at Pamba, pure reed patch, no under growth, plenty of litter on soil surface.

Depth (cm)	Horizon	Characteristics
0-4	A1	Dark brown (7.5YR 3/4), sandy loam, crumb, loose, non-plastic, abundant roots, presence of partly decomposed litter.
4-64	A2	Brown (7.5 YR 5/4), sandy loam, granular, loose, non-plastic, abundant roots.
64-95	Bw	Brown (10 YR 5/8), sandy loam, loose, friable, non-plastic, presence of rock fragments and roots.
95+	C	Weathered rock

Profile No. 4
Site features :

Middle of a hill at Vazhachal, elevation 550 m asl, northern aspect, open land with scattered distribution of moist deciduous seedlings.

Depth (cm)	Horizon	Characteristics
0-8	A1	Dark brown (7.5YR 3/4), gravelly sandy clay, granular, slightly plastic, moist friable, plenty of fine roots.
8-22	A2	Dark reddish brown (5YR 3/3), clay loam, weak development of sub-angular blocky, moist firm, slightly plastic, presence of fine roots.
22-60	Bt1	Reddish brown (5YR 4/3), clay loam, sub-angular blocky structure, firm, sticky and plastic, presence of lateritic gravel.
60-150+	Bt2	Reddish brown (5YR 4/3) clay loam, sub-angular blocky structure, firm, sticky and plastic, presence of concretions and hard lateritic gravel.

Contd...

Profile No. 5
Site features :

Valley of a hill at Pooyamkutty, degraded moist deciduous forest, canopy opened, plenty of under growth, very near to water course, abundant litter on soil surface, plenty of exposed rocks.

Depth (cm)	Horizon	Characteristics
0-18	A	Dark reddish brown (5YR 3/2), sandy loam, granular, friable, presence of roots and very few decomposing litter.
18-60	Bt1	Dark red (2.5YR 3/6), gravelly sandy clay, granular, yellow mottling with red and black admixture, very few roots.
60-108	Bt2	Dark red (2.5YR 3/6), gravelly sandy clay loam, sub-angular blocky structure, yellow mottling with red and black admixture, no roots.
108+	C	Rocky layer.

Profile No. 6
Site features :

Lower middle of a hill at Pamba, degraded moist deciduous forest , lot of under growth and litter on soil surface, canopy is almost opened.

Depth (cm)	Horizon	Characteristics
0-4	A	Very dark brown (10YR 2/2), gravelly sandy clay loam, granular, friable, presence of decomposing litter, abundant roots.
48-75	Bt1	Yellowish red (5YR 4/6), sandy clay loam, development of sub-angular blocky structure, slightly firm, few roots, presence of red mottles.
75-150+	Bt2	Red (2.5 YR 4/8), sandy clay loam, sub angular blocky, presence of lateritic gravel, few roots.

When soils of adjacent non-reed areas were considered, at Vazhachal due to the scarcity of vegetation the litter layer was absent but the soil was mostly covered with grasses and the site was opened. At Pooyamkutty and Pamba, since the moist deciduous forests occupied the adjacent non-reed area, there were plenty of litter on soil surface but not as much as in reed area.. Although sunlight reached the soil surface and encouraged under growth, the soil was found exposed at several places.

In all the profiles of reed growing areas, the uppermost A horizon carried high content of decomposing litter. The colour of the soils was mostly in the hue of 7.5 YR, ranging from brown to dark brown, imparted mainly by the decaying organic residues. The sub-surface layers were characterised mainly by the decrease in dark colour and this is attributed to the depletion of organic matter at lower depth. The extensive fine fibrous root system which ramifies vertically and horizontally binds the soil particles together resulting in the formation of granular and crumb structure especially in the surface horizon.

The good structural development may also be due to the binding action of the byproducts of microbes, sesquioxides and good drainage conditions. The soils of the subsurface layers were generally structureless in pure reed tracts. The cementing action exerted by the fine fibrous roots of reed is concentrated mainly in the surface layers.

Presence of cambic horizon was noted in all the profiles indicating that these soils are in the early stages of development. The gravel content was dominated by rock fragments rather than secondary lateritic gravels in all the profiles. As revealed in Profiles 1 and 2, reed was found to grow on both deep and shallow soils.

With regard to the morphological features of soil profiles in the adjacent non-reed areas at Vazhachal, the surface horizon was endowed with plenty of fine fibrous roots contributed by the grassy cover. But in comparison with reed, they were devoid of fallen decomposing litter due to the absence of trees contributing this. As in the case of reed, the colour of the surface soil was dark brown, but the subsurface layers showed decrease in dark colour along with simultaneous dominance of red colour. This is thought to be due to the depletion of organic matter at lower depth coupled with the increase in the content of sesquioxides. The surface horizon showed both crumb and granular structure while the development of sub angular blocky structure was observed at subsurface layers. Both gravelly clay loam and gravelly clayey texture types were present with an accumulation of clay at subsurface to satisfy the requirement of an argillic horizon. Unlike in reed growing soils, the gravel content was dominated by secondary lateritic gravels. The surface horizons of the soil profiles in the adjacent non-reed areas of moist deciduous forests of Pooyamkutty and Pamba carried decomposing litter similar to that of reed, but fine fibrous root systems were absent in these soils. An increase in the intensity of either red or yellow colour with increase in the depth of soil profiles was also noticed. The surface horizon showed granular structure while the subsurface layers showed sub-angular blocky structure. In these soils, the texture of surface horizon was gravelly sandy loam and the subsurface layers carried higher content of clay revealing the presence of an argillic horizon.

Hence the results, in general, confirm that colour, structure, texture and the development of subsurface horizons are greatly influenced by the growth of reed when compared with the adjacent non-reed areas. The dominance of brown colour and coarse texture throughout the soil profiles and the presence of cambic horizon seems to be characteristic of reed growing soils when compared with the adjacent non-reed soils. This points out the fact that reed might have established on these soils at an early stage of soil development and hitherto plays a great role on its overall development through the protective umbrella of canopy, litter and root mat.

Physical and chemical properties of soil profiles in reed and adjacent non-reed areas : With regard to the physical properties of reed growing soils (Table 2), gravel content was relatively low throughout the profiles and found dominated by rock fragments rather than secondary lateritic gravels. Secondary gravel formation is usually due to the exposure of soil to the direct actions of rain and sun as a result of which the

Table 2

Physical properties of soil profiles in reed and adjacent non reed areas

Profile No.	Vege-tation	Depth (cm)	Horizon	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	BD (gcm^{-3})	MWC (%)
1	Reed	0-6	A1	9.3	75.9	9.1	15.0	0.89	36.8
		6-62	A2	10.9	72.3	13.2	14.5	1.02	35.9
		62-80	Bw1	21.2	72.0	12.0	16.0	1.18	34.4
		80-108	Bw2	15.5	72.7	11.0	16.3	1.41	35.4
		108-126+	Bw3	3.0	76.0	11.0	13.0	1.46	27.8
2	Reed	0-4	A	6.2	75.8	9.8	14.4	0.88	39.2
		4-48	Bw	12.0	72.6	12.6	14.8	1.00	35.1
3	Reed	0-4	A1	3.4	73.9	12.0	14.1	0.92	38.8
		4-64	A2	12.5	78.1	7.4	14.5	1.06	34.3
		64-95+	Bw	10.8	77.5	9.0	13.5	1.18	31.7
4	Non-reed	0-8	A1	18.4	66.0	2.4	31.6	0.98	48.9
		8-22	A2	28.6	57.1	8.9	34.0	1.07	45.3
		22-60	Bt1	62.5	53.0	8.6	38.4	1.14	46.0
		60-150+	Bt2	78.2	40.7	10.4	48.9	1.24	45.4
5	Non-reed	0-18	A	21.6	74.0	14.0	16.0	1.28	38.8
		18-60	Bt1	15.4	58.0	16.0	42.0	1.30	34.6
		60-108	Bt2	26.8	57.8	12.0	30.0	1.34	36.0
6	Non-reed	0-48	A	17.6	58.0	20.0	22.0	1.30	37.9
		48-75	Bt1	23.3	64.0	9.0	27.0	1.38	32.4
		75-150+	Bt2	26.6	59.8	11.1	17.3	1.41	29.1

hardening of soil aggregates and formation of concretions take place consequent to the partial leaching of soil constituents. Soils under reed are not exposed to the actions of sun and rain due to the presence of the thick vegetative canopy. This could explain the relatively low content of secondary gravel observed in these soils. Moreover, the accumulation of litter and matting of fine roots protect the soil from the drastic weathering processes under the influence of heavy rainfall. Among the textural constituents, the sand fraction dominated and no definite pattern in the case of sand and silt was observed with increase in depth of soil profiles. These soils showed low values of illuvial clay in the B horizon. Bulk density of soil, especially at the surface layer, was very low caused by the high accumulation of organic matter and fibrous root mat and it increased with depth. But in contrast, the water holding capacity was decreasing towards the lower horizons of the profiles which can be attributed mainly to the lesser content of organic matter and fine soil particles at lower layers.

But the profiles struck at adjacent non-reed areas in all the locations revealed the dominance of secondary lateritic gravels. Unlike in reed growing soils, higher content of clay was observed throughout the profiles and noticeable content of illuvial clay to satisfy the requirement of an agillic horizon was prevalent in these soils. The adjacent area at Vazhachal was completely open and at other two locations it was more or less open compared to reed area. This might have played a great role in intensifying the process of soil development resulting in higher content of illuvial clay and lateritic gravel. Bulk density also showed an increasing trend with depth in the profiles as in reed growing soils. At Vazhachal, the lower bulk density of surface horizon is thought to be mainly due to the influence of fine fibrous roots of grasses while at other two locations the decomposing litter might have played a major role. But in reed growing soils, both these factors influence the bulk density. Maximum water holding capacity was highest in the surface horizon of the profiles at all locations.

As revealed in Table 3, reed growing soils were strongly to moderately acidic in reaction and the acidity was more in the surface than the layer just below it. The higher acidity of surface soils may be due to a relatively higher prevalence of organic matter at varying stages of decomposition which can release large amounts of organic acids. Thomas and Sujatha (1992) also reported an increase of pH with depth in pure reed patches of Ranni Forest Division in Kerala. These soils contained relatively higher content of organic carbon and as expected a progressive decrease towards lower layers of the profiles was prevalent. Unlike in other forest vegetations, addition of organic matter through an extensively ramifying root systems also contributes to the total pool of organic matter. Sanalkumar *et al.* (1998) had recorded high diversity of soil faunal groups in reed growing soils of Vazhachal and majority of them were found to help in the degradation of reed leaf litter. An accumulation of bases on soil surface and their decrease with increase in depth of soil profiles was also noted in this study. This highlights the influence of organic residues of reed in enriching the soil surface with bases. The closed canopy of reed and fast uptake of nutrients may not be permitting the rapid leaching of bases down the profiles. The extensive ramification of fibrous roots of reed spread over the soil surface is also thought to have a greater role in reducing the loss of bases through gravitational flow of water especially in dense reed stands. Among the exchangeable bases, Ca dominated followed by Mg and K. The data also revealed that the contribution of Na in deciding the exchangeable base status of these soils was not remarkable which is the case with acid soils in general. The values of exchange acidity were higher in the surface horizons of all the profiles and this is attributed to the dominating influence of organic acids released during the decomposition of reed leaf litter.

The soils of adjacent non-reed areas, in general, were also acid in reaction and the acidity of surface horizon was comparatively less than that of the sub surface layers especially at Pooyamkutty and Pamba. This is thought to be due to

Table 3

Chemical properties of soil profiles in reed and adjacent non-reed areas

Profile No.	Vege-tation	Depth (cm)	Horizon	pH	OC (%)	Exch. acidity cmol (+)/kg	Exchangeable bases cmol (+) /kg					Bray extract-able P (ppm)
							Ca^+	Mg^+	K^+	Na^+	Total	
1	Reed bamboo	0-6	A1	4.65	2.98	3.10	1.70	1.40	0.32	0.10	3.52	4.8
		6-62	A2	4.81	1.38	2.60	1.30	0.90	0.13	0.09	2.42	3.6
		62-80	Bw1	4.80	0.72	2.40	1.40	0.90	0.04	0.08	2.42	4.4
		80-108	Bw2	5.01	0.52	1.00	1.90	0.40	0.04	0.09	2.43	2.8
		108-126+	Bw3	5.01	0.30	1.50	1.10	0.80	0.03	0.08	1.29	3.0
2	Reed bamboo	0-4	A	4.70	2.56	2.20	2.80	0.40	1.17	0.05	4.42	8.2
		4-48	Bw	4.85	1.82	0.60	1.40	0.10	0.28	0.07	1.85	2.5
3	Reed bamboo	0-4	A1	4.71	2.38	2.12	2.40	0.20	0.26	0.06	2.92	9.9
		4-64	A2	5.11	1.68	0.70	0.60	0.20	0.15	0.06	1.01	3.6
		64-95+	Bw	5.02	1.17	0.30	0.70	0.10	0.08	0.05	1.03	2.4
4	Non-Reed bamboo	0-8	A1	4.48	1.40	2.22	1.00	0.68	0.08	0.05	1.81	3.2
		8-22	A2	4.54	1.26	1.58	1.60	0.42	0.03	0.05	2.10	3.2
		22-60	Bt1	4.85	1.18	1.40	1.54	0.31	0.03	0.08	1.96	2.4
		60-150+	Bt2	5.05	0.84	1.00	0.72	0.34	0.05	0.06	1.17	2.0
5	Non-Reed bamboo	0-18	A	5.28	1.68	1.60	2.56	1.20	1.45	0.06	5.27	3.9
		18-60	Bt1	4.76	0.64	1.01	2.85	1.25	1.34	0.06	5.50	6.4
		60-108	Bt2	5.01	0.42	0.64	2.21	0.85	1.40	0.04	4.50	4.2
6	Non-Reed bamboo	0-48	A	5.32	1.74	1.42	2.32	1.02	1.32	0.05	4.71	4.1
		48-75	Bt1	4.80	0.95	1.24	2.64	1.13	1.48	0.04	5.29	2.4
		75-150+	Bt2	4.82	0.50	0.20	1.16	0.06	0.17	0.04	1.43	traces

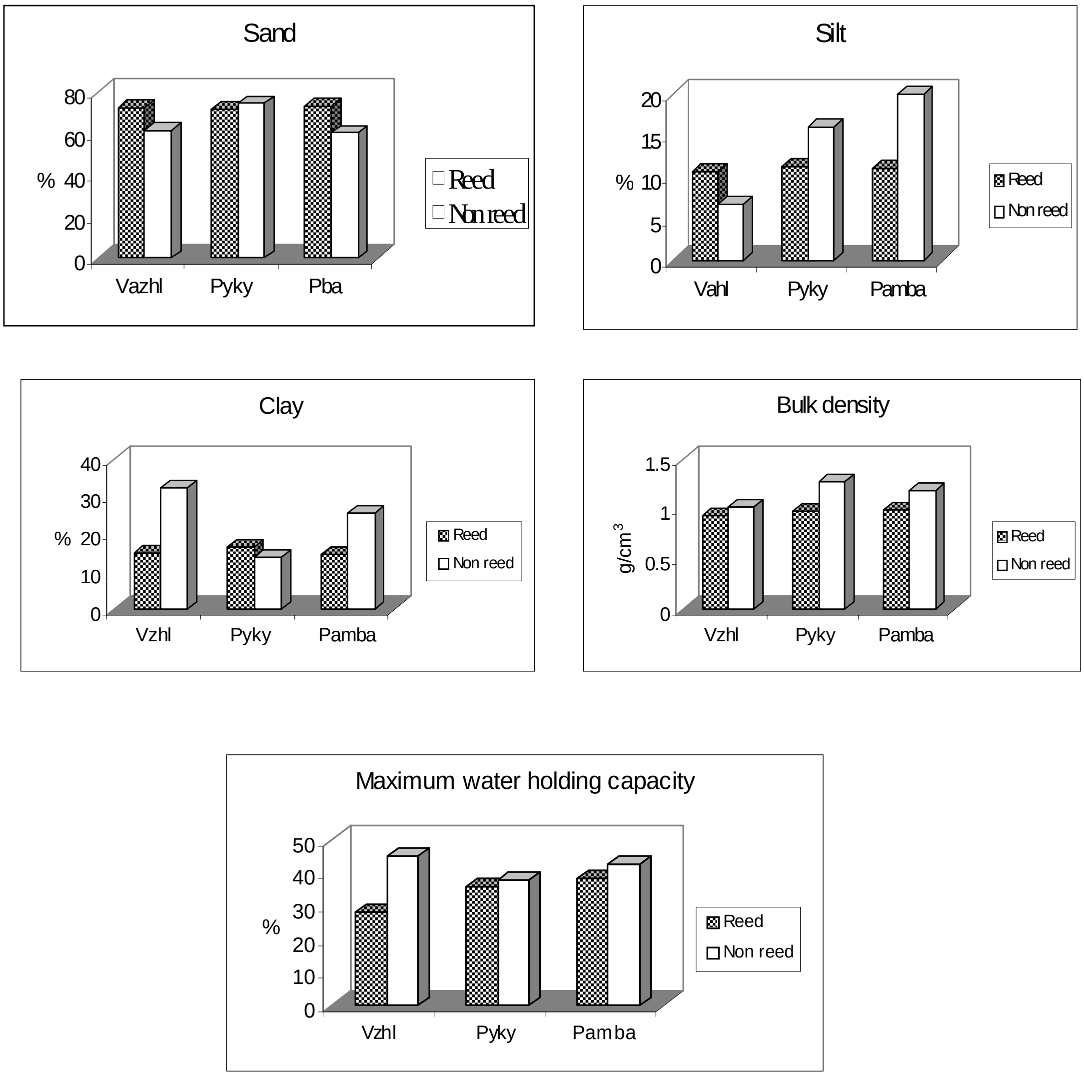
the contribution from the decomposing vegetational residues containing more bases than reed area. With regard to the content of organic carbon, the surface horizon of all the profiles invariably recorded higher values and a steady decrease with depth was observed as in the case of reed. At Vazhachal, the organic enrichment of surface horizon was mainly from the fine roots of grasses while at other two locations the litter from the moist deciduous trees enriched the organic pool. Among the exchangeable cations, Ca dominated in all the profiles and the order of abundance was Ca > Mg > K> Na. The distribution of these bases with depth was irregular for all the pedons studied and it was more in subsurface layer than surface, attributed mainly to the leaching through the gravitational water. As observed in reed growing soils, the exchange acidity was higher in the surface horizons, and it decreased towards lower side of the profiles.

Fertility status of soils (0-15 cm) in reed and adjacent non-reed areas : Reed bamboo being a fast growing plant with fibrous root system, most of the nutrient transformations are expected to be associated with the soil up to a depth of 15 cm from the surface. So the fertility status of these soils with respect to various physical and chemical properties was studied by collecting soil samples to a depth of 15 cm. A total of 15 soil samples were collected at random from reed and adjacent non-reed areas separately at each location and the soil properties were compared (Fig. 2).

Surface soils of reed growing tracts generally exhibited low content of gravel and it was found dominated by rock fragments rather than secondary gravel . The textural make-up of these soils was dominated by sand with little silt and clay. So, in general, the texture of these soils was sandy loam. Sujatha (1999) also reported that reed growing soils are coarse-textured in nature. According to the Geological Survey of India (1976), the soils in these areas were derived from rocks such as charnockites, gneisses and granites. These are silica rich and coarse grained rocks. This can be the reason for the dominance of sandy loam texture of these soils. Studies on different species of bamboo (Kadambi, 1949; Kaul, 1964; Koppar, 1980) also indicate that thrive well in well-drained coarse textured soils with adequate moisture. Low values of bulk density in spite of sandy loam texture can be due to the fine roots interspersing through soil particles coupled with high content of organic carbon. The organic substances released from soil fauna (both micro and macro) and plant roots are also thought to have a greater role in reducing bulk density and thus increasing the porosity of these soils. The water holding capacity of these soils inspite of coarse texture was moderately high which can be the reflection of high content of organic carbon.

With respect to chemical properties (Fig. 3), these soils were strongly acid in reaction with pH values ranging from 4.68 to 4.74. Quershi *et al.* (1969) also reported the acidic nature of bamboo (*Bambusa arundinaceae*) growing soils. Koppar (1980) was also of the opinion that Indian bamboos preferred soils of acidic to neutral pH. The acidity is thought to be contributed mainly from the non-calcareous rocks from which the soils are formed. The organic acids released during decomposition of organic residues also play a major role in increasing the acidity of

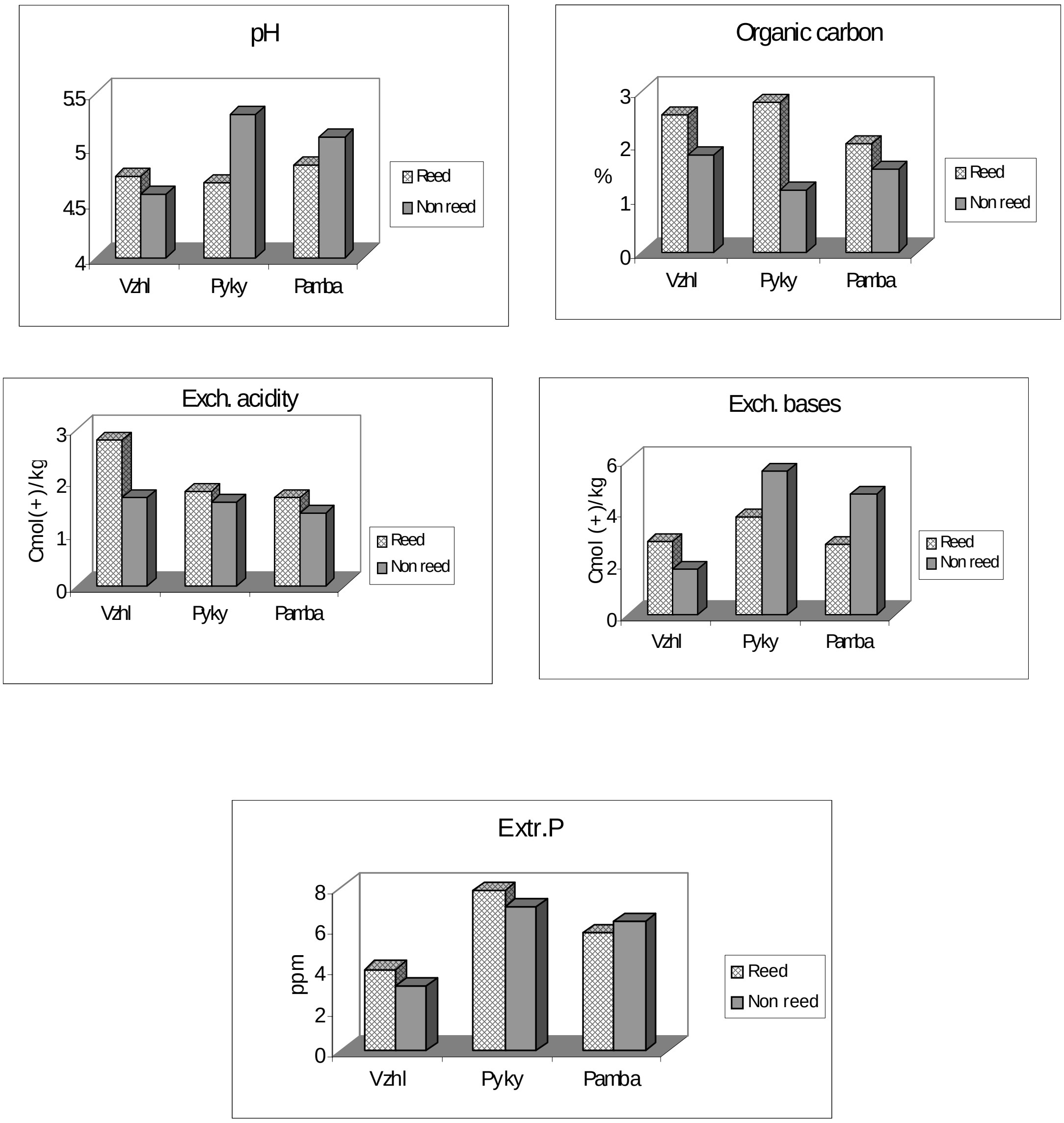
Fig. 2



Physical properties of surface soils in reed and adjacent non-reed areas

these soils. Higher content of organic carbon (2-2.5 %) noted in these soils when compared with other forest plantations of the State can be attributed to the contribution from thick litter cover on soil surface together with the fine fibrous ramifying root system, characteristic of this plant. The status of extractable P was low. The low extractable P in these soils can be due to its fixation at low pH. The content of exchangeable bases was moderate and it is assumed that these bases were released by the decomposition of organic plant residues.

Fig. 3



Chemical properties of surface soils in reed and adjacent non-reed areas

In the surface soils of adjacent non-reed soils, significantly higher content of secondary lateritic gravel was observed at all the locations irrespective of the kind of vegetation, the reason for which has been explained under the profile study. But the textural make-up differed with location and vegetation. Compared to reed, significantly lower content of sand and higher content of clay were observed at Vazhachal and Pamba. The soil was more compact as indicated by the higher values of bulk density at Pooyamkutty and Pamba, and this might be due to the lack of fine fibrous roots which make the soil more porous. The water holding capacity did not show significant difference between reed and non-reed soils except at Vazhachal, attributed mainly due to the higher content of fine soil separates.

The acidity of soil did not differ much when both reed and non-reed soils were compared at Vazhachal. But at other two locations, the soils of adjacent non-reed area were less acidic and this is thought to be due to the influence of bases released due to the decomposition of base rich leaf litter. Significantly lower content of organic carbon was observed in these soils at all the locations but the exchangeable base status was higher in non-reed soils occupied by moist deciduous forests.

Conclusion

The results, in general revealed that reed bamboo plays a great role on overall development and fertility of soils through its protective umbrella of canopy, litter and root mat compared to its adjacent non reed bamboo areas.

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SUMMARY

Considering the importance of reed bamboo (*Ochlandra travancorica*) in cottage and paper industries along with its indigenous ecofriendly and fast growing nature, this study was conducted to evaluate the impact of reed bamboo on soil characteristics. For this typical soil profiles were studied in three major reed growing areas of Kerala State viz., Vazhachal, Pooyamkutty and Pamba and various soil properties were compared with those of adjacent non-reed bamboo areas. Results revealed that colour, structure, texture and the development of subsurface horizons are greatly influenced by the growth of reed when compared with the adjacent non-reed areas. The dominance of brown colour and coarse texture throughout the soil profiles and the presence of cambic horizon seemed to be characteristic of reed growing soils. A high dominance and increase in the content of lateritic gravel and accumulation of clay in the subsurface layers were noted in non-reed soils than reed soils. The surface soils of reed growing areas were coarse-textured, loose and acidic with higher content of organic matter. Results in general indicated that reed bamboo plays a great role on overall development and fertility of soils through its protective umbrella of canopy, litter and root mat.

Key words : **Reed bamboo, Soil properties, Western Ghats, Kerala.**

नरकुल बांस (*औक्लैण्ड्रा ट्रावनकोरिका*) से केरल के पश्चिमी घाट प्रदेश की मृदाओं पर पड़ता प्रभाव – साथ लगते गैर–नरकुल बांस क्षेत्रों के साथ किया गया तुलनात्मक अध्ययन

एम०पी० सुजाता, टी०पी० थॉमस व एस० शंकर

सारांश

अपनी देशज परिस्थिति–मित्र और शीघ्रवर्धी प्रकृति के साथ–साथ कुटीर और कागज उद्योगों में नरकुल

बांस (*औक्लैण्ड्रा ट्रावनकोरिका*) के महत्व को देखते हुए इस नरकुल बांस से मृदा की विशेषताओं पर पड़ते प्रभावों का मूल्यांकित करने को यह अध्ययन किया गया। अध्ययनार्थ राज्य के तीन नरकुल बांस उत्पादक क्षेत्रों, अर्थात् वझचल, पूयमकुट्टी और पाम्बा की प्रारूपिक मृदाभूमियों का अध्ययन करके उनकी विभिन्न मृदा विशेषताओं की तुलना उनके साथ लगते गैर नरकुल बांस क्षेत्रों की मृदा–विशेषताओं से की गई। परिणामों से पता चला कि साथ लगते गैर नरकुल बांस क्षेत्रों से तुलना करने पर नरकुल–बांस क्षेत्रों की मृदा का रंग संरचना, बनावट और उपस्तरीय संस्तरों का विकास नरकुल–बांसों की बढ़वार से बहुत प्रभावित होता है। मृदा पार्श्वचित्रों में सर्वत्र भूरे रंग और स्थूल वयन का प्राचुर्य तथा हेमन्वयुगीन संस्तर की उपस्थिति नरकुल–बांस उत्पादक मृदाओं की विशिष्टिता प्रतीत होती है। नरकुल–बांस मृदाओं की अपेक्षा गैर नरकुल–बांस मृदाओं की उपस्तरीय परतों में लेटराइटी (इष्टकिजीव) बजरी की मात्रा और चिक्कण मिट्टी के संचयन में वृद्धि का अधिक बाहुल्य देखा गया। नरकुल–बांस उत्पादक क्षेत्रों की मृदाओं का स्तर स्थूल–वयन, शिथिल और अम्लीय था जिसमें जैव तत्व की अधिकता थी। परिणामों से यह सामान्य संकेत मिलता है कि नरकुल–बांस अपने वितान के रक्षात्मक छत्र, पर्णास्तरण और जड़ों से बनी चटाई मृदा के समग्र विकास और उसकी उर्वरता बनाने में बड़ी भूमिका निबाहते हैं।

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