Proposed by F.R. Moormann, 1963
Revised by :
P. Vijarnsorn and staffs, 1988
W. Sirichuaychoo, 2004

KLAENG SERIES **Field Symbol: Kl**

Distribution: Occupies moderate extent in Peninsular Thailand and in Southeast Coastal of Thailand.

Setting: Klaeng soils are formed alluvium on alluvium plain. Relief is level to nearly level. Slope is less than 1 percent. Elevation ranges from 10 to 20 m above mean sea level. The climate is Tropical Monsoon (Koppen 'Am') or Tropical Savanna (Koppen 'Aw'). Average annual precipitation is from 1,800 to 3,000 mm. Average annual air temperature is from 26 ^{o}C to 28^{o}C.

Drainage, Permeability and Surface Runoff: Drainage is poorly drained, permeability is slow and surface runoff is estimated to be slow. Flooded by impounded rain water up to 30 cm for 3 to 4 months. Ground water level below 1 meter during the dry season.

Vegetation and Land Use: Mainly used for transplanted rice but scattered areas of low shrubs (*Malaleuca Leucadendron*) and wet grassland occur. In some areas para rubber, sugar cane and fruit trees are grown.

Characteristic Profile Features: The Klaeng series is a member of the very-fine, kaolinitic, isohyperthermic Typic Plinthaquults (soil taxonomy, 2003). They are very deep soils and are characterized by a yellowish brown, grayish brown or gray clay loam surface or A horizon overlying a gray or light gray clay subsurface horizon which in turn overlies a gray or light gray clay argillic B horizon. These soils are mottled throughout with common and many fine and medium strong brown and yellowish brown at the surface; common medium yellowish brown, strong brown with yellowish red and red in the subsurface and dominant red or dusky red in the subsoil within 150 cm from the soil surface. Strongly acid to moderately acid, reaction values range from 5.5 to 6.0 over very strongly acid to strongly acid, reaction values range from 4.5 to 5.5.

Typifying Pedon: Klaeng clay loam - transplanted rice, from Amphoe Sawi, Changwat Chumphon, less than 2 percent slopes (sheet name Khao Suan Thu Rian, sheet number 4841 IV).

Profile Code Number: S-58/37, described by P. Pramojanee, 8 May 1970 (moist colors unless otherwise stated).

Horizon	Depth (cm)	Description
Apg	0-10	Dark grayish brown (10YR4/2) clay loam; few iron mottles coating along roots channels; moderate medium subangular blocky structure; slightly hard, slightly sticky and slightly plastic; common medium tubular and few medium interstitial pores; many fine and medium roots; very strongly acid (field pH 5.0); clear wavy boundary.
Bg	10-26	Light gray to gray (10YR6/1) clay; many fine prominent yellowish red (5YR5/6) mottles along roots channels; moderate medium and coarse subangular blocky structure; hard, sticky and plastic; black possible humus coating on ped faces and along cracks; few fine tubular and common medium interstitial pores; many fine roots; very strongly acid (field pH 4.5); gradual smooth boundary.
Btg	26-42	Grayish brown (10YR5/2) clay; common medium prominent yellowish red (5YR4/6) and distinct strong brown (7.5YR5/8) mottles; strong medium and coarse subangular blocky structure; very hard, sticky and plastic; common patchy thin cutan on ped faces; few fine tubular pores, common fine and medium interstitial pores; common very fine roots; very strongly acid (field pH 4.5); clear smooth boundary.
Btgv1	42-65	Gray (10YR5/1) clay; many medium and coarse prominent dark red (10R3/6) and strong brown (7.5YR5/6) mottles; moderate fine and medium subangular blocky structure; sticky and plastic; many patchy moderately thick cutan on ped

faces; Plinthite (10YR3/6, red) ≥ 50% by volume of the soil matrix or continuous phase; few fine tubular and common fine interstitial pores; few fine roots; very strongly acid (field pH 4.5); clear smooth boundary.

Btgv2 65+ Gray (10YR5/1) clay; many medium and coarse prominent dark red (10R3/6) mottles; moderate fine and medium subangular blocky structure; sticky and plastic; many patchy moderately thick cutan on ped faces; Plinthite (10YR3/6, red) ≥ 50% by volume of the soil matrix or continuous phase; few medium tubular and common fine interstitial pores; very strongly acid (field pH 4.5).

Type Location:

Name of district, Amphoe Klaeng, Changwat Rayong.

Range of Profile Features:

The surface or A or Ap horizon clay loam, is 10 to 20 cm in thickness and has 10YR or 7.5YR hues, values 4 to 6 and chromas 1 or 2. Structure is weak fine and medium subangular blocky. Texture is silty clay loam or clay may occur. Very strongly acid to slightly acid, reaction values range from 5.0 to 6.5.

The upper of argillic B horizon clay, has 10YR hues, values 5 to 7 and chromas 2 or less. The moderate fine and medium blocky structure. Very strongly acid to moderately acid, reaction values range from 5.0 to 6.0.

The lower argillic B or BC horizon clay, is strongly expressed and varies in size from medium to coarse blocky, 10YR to 7.5YR hues, values 6 to 7 and chromas 2 or less, and red mottled (plinthite) more than 50 percent by volume within 150 cm from the soil surface or continuous phase. The acidity decreases with depth, very strongly acid to strongly acid, reaction values range from 4.5 to 5.5. Sandy clay or silty clay texture may occur in this horizon.

Similar Soil Series:

Bang Nara series (Ba): fine, kaolinitic, isohyperthermic Typic Paleaquults, brownish and yellowish mottles within 150 cm from the soil surface (no plinthite).

Phatthalung series (Ptl): fine, kaolinitic, isohyperthermic Plinthic Paleaquults, reddish mottles of plinthite 5 to 50 percent within 150 cm from the soil surface.

Visai series (Vi): fine-loamy, mixed, semiactive, isohyperthermic Typic Plinthaquults.

Principal Associated Soils:

These include Bang Nara and Phatthalung series.

ANALYSIS RESULTS

(oven dry basis)

Profile code No.: S-58/37

Soil series: Klaeng series (Kl)

Lab No.	Depth (cm)	Horizon	Particle size distribution analysis (% by weight)								Texture		pH		$CaCO_3$ %	P, mg kg^{-1} Bray 2	K, mg kg^{-1} NH_4OAc
			USDA grading			Sand-fraction grading					Lab	Field	1:1	1:1			
			sand	silt	clay	vc	c	m	f	vf	result	estim[n]	water	KCl			
Po-881	0-10	A	52.0	38.0	10.0						sl-l	cl	4.9	3.4	0.0	5.1	30
Po-882	10-26	Bg	26.0	32.0	42.0						c	c	5.0	3.5	0.0	2.0	36
Po-883	26-42	Btg	22.0	27.0	51.0						c	c	4.9	3.2	0.6	2.8	45
Po-884	42-65	Btgv1	16.0	16.0	68.0						c	c	5.0	3.3	0.4	4.0	51
Po-885	65+	Btgv2	16.0	18.0	66.0						c	c	4.9	3.4	0.9	4.1	60

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations ($cmol_{(+)}$ kg^{-1})									Base satur[n] (%)		ECEC $cmol_{(+)}$ kg^{-1} (B+D)	Al KCl extr. $cmol_{(+)}$ kg^{-1} (D)	Electrical conduct[y] ($ECx10^6$) dS m^{-1}
				Ca	Mg	K	Na	SUM cations (B)	Extr. acidity (A)	SUM (B+A)	CEC NH_4OAc (C)	CEC 100g Clay	B/Cx100	(Bx100)/ (B+A)			
0-10	0.7	0.84		0.70	0.40	0.10	0.20	1.40	4.90	6.30	4.9	49.0	29	22			0.05
10-26	1.8	0.33		0.70	0.50	0.10	0.20	1.50	11.40	12.90	12.8	30.5	12	12			0.02
26-42	2.0	0.25		0.40	0.40	0.10	0.20	1.10	14.00	15.10	14.2	27.8	8	7			0.02
42-65	7.4	0.24		1.10	0.60	0.10	0.30	2.10	19.00	21.10	21.4	31.5	10	10			0.03
65+	3.1	0.18		0.40	0.70	0.10	0.40	1.60	19.10	20.70	19.8	30.0	8	8			0.03

Surveyor: P. Pramojanee

Date: May 8, 1970

Reported by: W. Sirichuaychoo

Date: Nov. 7, 1998