

Proposed by S.Charoenpong, 1973
 Revised by :
 P. Vijarnsorn and staffs, 1988
 W. Sirichuaychoo, 2004

THUNG KHAI SERIES

Field Symbols: Tuk

Distribution: Occupies moderate extent in Peninsular Thailand and some area in Southeast Coast of Thailand.

Setting: Thung Khai soils are formed from alluvium and occurred on alluvial plain. Relief is level. Slope is less than 1 percent. Elevation ranges from 2 to 10 m above mean sea level. The climate is Tropical Monsoon (Koppen 'Am') or Tropical Rain Forest (Koppen 'Af'). Average annual precipitation is above 2,000 mm. Average annual air temperature is from 26 °C to 28°C.

Drainage, Permeability and Surface Runoff: Drainage is poorly drained, permeability is estimated to be slow and surface runoff is very slow. Ground water level lies within 1 meter almost throughout the year, flooding commonly occurred for 2 to 3 months during the peak of rainy season.

Vegetation and Land Use: Most areas are bare patches or occupied by native grasses and low shrubs. Land use is almost none.

Characteristic Profile Features: The Thung Khai series is a member of the clayey-skeletal, mixed, active, nonacid, isohyperthermic Aeric Endoaquepts (soil taxonomy, 2003). They are very shallow soils to secondary lime and are characterized by a very dark grayish brown or grayish brown clay loam surface or A horizon overlying a brown or light yellowish brown very gravelly clay loam cambic B horizon. These inturn overly a gray or light gray very gravelly clay grading to clay or silty clay C horizon. Mottles of yellowish and brownish commonly occur throughout subsoil. Secondary lime concretions may also present in subsoil. Slightly acid to neutral, reaction values range from 6.5 to 7.0 in surface and slightly alkaline to moderately alkaline, reaction values range from 8.0 to 8.5 in subsoil.

Typifying Pedon: Thung Khai fine sandy loam - grass land, Ban Han, Tambon Kampaeng, Amphoe La-ngu, Changwat Satun, 15 m above mean sea level, 3 to 5 percent slopes (sheet number 4922 I NW).

Profile Code Number: S-67/121, described by Pramote Hemsrichart, 15 May 1974 (moist colors unless otherwise stated).

Horizon	Depth (cm)	Description
A1	0-7	Dark brown to brown (10YR4/3) loam; common fine distinct strong brown (7.5YR5/8) mottles along roots channels; weak fine and medium subangular blocky structure; very friable, slightly sticky and slightly plastic; common very fine interstitial pores; abundant very fine and common fine roots; moderately acid (field pH 6.0); clear smooth boundary.
A2	7-15/19	Mixed yellowish brown (10YR5/4) and strong brown (7.5YR5/8) slightly gravelly clay loam; weak fine and medium subangular blocky structure; friable, slightly sticky and slightly plastic; common very fine interstitial pores; abundant very fine and few medium roots; moderately acid (field pH 6.0); clear wavy boundary.
Bc	15/19-30/34	Light yellowish brown (10YR6/4) very gravelly clay; common fine prominent red (2.5YR4/8) mottles; friable, sticky and slightly plastic; common very fine roots; neutral (field pH 7.0); clear wavy boundary.
Bcg1	30/34-70/72	Light gray (10YR7/1) very gravelly clay; few fine distinct yellowish brown (10YR5/8) mottles; friable, sticky and slightly plastic; common moderately thick krotovina; few very fine roots; many lime concretion; moderately alkaline (field pH 8.0); clear wavy boundary.

- Bcg2 70/72-84/87 Light gray (10YR7/1) gravelly silty clay; common fine and medium distinct yellowish brown (10YR5/8) mottles; friable, sticky and slightly plastic; common lime concretion; moderately alkaline (field pH 8.0); clear wavy boundary.
- Bcg3 84/87-150 Light gray (10YR7/1-2) gravelly silty clay; common medium distinct yellowish brown (10YR5/8) mottles; friable, sticky and slightly plastic; gravels composed mainly of lime concretion and small iron stones; moderately alkaline (field pH 8.0).

Type Location:

Name of village, Ban Thung Kai, Amphoe Yan Ta Khao, Changwat Trang.

Range of Profile Features:

The surface or A horizon clay loam or clay is from 10 to 15 cm in thickness and has 10YR or 7.5YR hues, values 3 or 4 and chromas 2 to 4. Texture of sandy loam may occur. Structure is weak fine subangular blocky. Moderately acid to neutral, reaction values range from 6.0 to 7.5.

The cambic B horizon very gravelly clay, has 10YR hue, values 5 or 6 and chromas 3 or 4. Texture of very gravelly clay loam may also occur. Structure is difficult to describe due to presence of gravels which are mainly ironstones. Moderately acid to neutral, reaction values range from 6.0 to 7.5.

The C horizon has 10YR, 2.5Y or N/ hues, values 6 or 7 and chromas less than 2. Structure is massive. Neutral to moderately alkaline, reaction values range from 7.0 to 8.5. It should be noted that gravelly horizons are present within 50 cm of the soil surface and have total thickness of 40 to 60 cm. Laterite boulders may be scattered over the soil in some areas and make cultivation impracticable.

Similar Soil Series:

Principal Associated Soils:

These mainly include La-ngu series.

La-ngu series (Lgu): fine, kaolinitic, isohyperthermic Typic Endoaqualfs.

ANALYSIS RESULTS

Profile code No.: S-67/121

(oven dry basis)

Soil series: Thung Kai series (Tuk)

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 ₄ OAc	
			USDA grading			Sand-fraction grading					Lab	Field	1:1	1:1				
			sand	silt	clay	vc	c	m	f	vf	result	estim ⁿ	water	KCl				
Pe-1045	0-7	A1	24.5	70.5	5.0							sil	l	4.8	3.7	0.1	1.4	29
Pe-1046	7-15/19	A2	38.5	49.5	12.0							l	sli.gcl	5.4	4.1	0.0	1.1	15
Pe-1047	19-30/34	Bc	47.5	29.5	23.0							l	vgc	5.7	4.0	0.2	1.4	29
Pe-1048	34-70/72	Bcg1	41.5	23.0	35.5							cl	vgc	7.7	6.3	0.0	2.2	38
Pe-1049	72-84/87	Bcg2	19.5	37.5	43.0							sicl	gsic	7.7	6.6	5.1	1.6	24
Pe-1050	87-150	Bcg3	17.0	43.5	39.5							sicl	gsic	7.7	6.5	2.7	1.2	24

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)	AI KCl extr. cmol ₍₊₎ kg ⁻¹ (D)	Electrical conductivity (ECx10 ⁶) dS m ⁻¹
				Ca	Mg	K	Na	SUM cations (B)	Extr. acidity (A)	SUM (B+A)	CEC NH ₄ OAc (C)	CEC 100g Clay	B/Cx100	(Bx100)/(B+A)				
0-7	1.3	1.21		1.20	0.30	0.10	0.30	1.90	8.40	10.30	5.2	104.0	37	18			0.25	
7-15/19	1.0	2.02		1.10	0.10	0.10	0.30	1.60	7.90	9.50	6.6	55.0	24	17			0.04	
19-30/34	2.2	0.41		7.10	0.20	0.10	0.30	7.70	6.50	14.20	12.1	52.6	64	54			0.08	
34-70/72	2.4	0.22		29.00	0.50	0.10	0.50	30.10	0.60	30.70	20.4	57.5	100	98			0.35	
72-84/87	3.0	0.16		30.20	0.70	0.10	0.40	31.40	0.30	31.70	21.8	50.7	100	99			0.36	
87-150	2.6	0.01		28.40	0.70	0.10	0.40	29.60	0.20	29.80	20.7	52.4	100	99			0.32	

Surveyor: P. Hemsrichart

Reported by: W. Sirichuaychoo

Date: May 15, 1974

Date: Nov. 5, 1998