

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

PHAK KAT SERIES

Field Symbol: Pat

Distribution: Occupies a small to moderate extent in the areas of Southeast Coast Thailand and in Peninsular Thailand.

Setting: Phak Kat soils are formed from relatively alluvium and occurred on alluvial plain. Relief is nearly level to gently undulating with slopes ranging from 1 to 5 percent. Elevation ranges from 100 to 160 m above mean sea level. The climate is Tropical Monsoon (Koppen 'Am'). Average annual precipitation is from 2,000 to 3,400 mm Average annual air temperature is 27°C.

Drainage, Permeability and Surface Runoff: Drainage is somewhat poorly drained, permeability is slow and surface runoff is slow to medium. Ground water level is within 1.5 m in the rainy season and falls below 1.5 m in the dry season.

Vegetation and Land Use: Mainly covered by tall grasses with scattered trees and Tropical Evergreen Forest. Parts are cleared for upland crops.

Characteristic Profile Features: The Phak Kat series is a member of the fine, mixed, semiactive, isohyperthermic Plinthaquic Paleudalfs (soil taxonomy, 2003). They are very deep soils and are characterized by a very dark grayish brown, dark grayish brown or dark brown clay loam surface or A horizon overlying a strong brown yellowish brown or brown clay loam or clay upper argillic B horizon which in turn overlies a light gray or light brownish gray clay lower argillic B horizon. Reaction is moderately acid to neutral, reaction values range from 6.0 to 7.0 at the surface and moderately acid to slightly acid, reaction values range from 6.0 to 6.5 in the subsoil. Mottles occur in the subsoil with yellowish red, reddish brown, red or dark red colors (plinthite less than 50 percent of the soil matrix).

Typifying Pedon: Phak Kat clay loam - Tropical Evergreen Forest, from area near Ban Phak Kat, Amphoe Pong Nam Ron, Changwat Chanthaburi, 2 to 5 percent slopes (sheet number 5449 I).

Profile Code Number: SE-17/24, described by: S. Kitiyarak and C. Chaengprai, 20 January 1973 (moist colors unless otherwise stated).

Horizon Depth (cm)	Description
A 0-13	Dark brown (10YR3/3) clay loam; strong fine and medium subangular blocky structure; hard, slightly firm, sticky and very plastic; many fine and medium interstitial pores, few fine and medium tubular pores; many fine and common medium roots; few fine subrounded iron nodules; slightly acid (field pH 6.5); clear smooth boundary.
Bt 13-34	Yellowish brown (10YR5/6-8) clay; common medium prominent red (2.5YR4/6) and dark reddish brown (5YR3/6) mottles; moderate medium and coarse subangular blocky breaking into strong fine subangular blocky structure; friable, sticky and plastic; patchy moderately thick clay coating on ped faces and thin continuous clay coating in pores; many fine interstitial pores, common fine and few medium tubular pores; common fine and medium roots; common fine and medium iron-manganese nodules; strongly acid (field pH 5.5); gradual smooth boundary.
Btgv1 34-74	Light gray (10YR7/2) clay; many medium prominent reddish brown (5YR5/4) and yellowish red (5YR5/6) mottles; strong fine and medium subangular blocky structure; friable, sticky and plastic; moderately thick broken clay coating on ped faces and continuous clay coating in pores; common plinthite; many fine interstitial pores, common fine and medium tubular pores; few fine and medium

roots; few fine feldspar pieces; strongly acid (field pH 5.5); gradual smooth boundary.

Btgv2 74-100 Light gray (10YR7/2) clay; many medium prominent dark red (2.5YR3/6) and yellowish red (5YR5/6) mottles; strong fine subangular blocky structure; friable, sticky and plastic; moderately thick broken clay coating on ped faces and continuous clay coating in pores; plinthite 20-50% by volume of the soil matrix; few fine roots; many fine and medium plinthite; strongly acid (field pH 5.5).

Remark: Plinthite 5-50% by volume of the soil matrix.

Type Location:

Name of village, Ban Phak Kat, Amphoe Pong Nam Ron, Changwat Chanthaburi.

Range of Profile Features:

The surface or A horizon clay loam or loam is 10 to 25 cm in thickness and has 10YR or 7.5YR hues, values 3 or 4 and chromas 2 to 4. Texture of silty clay loam or clay may occur. Structure is moderate and strong fine and medium subangular blocky. Moderately acid to neutral, reaction values range from 6.0 to 7.0.

The upper argillic B horizon clay has 10YR or 7.5YR hues, values 5 or 6 and chromas 4 to 8 whereas the lower argillic B horizon has 10YR or 2.5Y hues, values 6 to 7 and chromas 2 or less. Structures is moderate fine and medium subangular blocky. Texture of silty clay may occur. Very strongly acid to moderately acid, reaction values range from 5.0 to 6.0. Some scattered and subrounded iron-manganese nodules may occur throughout the profile.

Similar Soil Series:

La-ngu series (Lgu): fine, kaolinitic, isohyperthermic Typic Endoaqualfs, poorly drained and occurred in lower position.

Sai Buri series (Bu): fine-silty, kaolinitic, isohyperthermic Aquic Kandiodults, low base saturation and higher position.

Principle Association Soils:

These include O Lam Chiak. Pong Nam Ron and Bueng Chanang soils.

O Lam Chiak series (Oc): very-fine, mixed, active, isohyperthermic Typic Hapludalfs.

Pong Nam Ron series (Pon): fine-loamy, mixed, active, isohyperthermic, shallow Typic Hapludolls.

Bueng Chanang series (Bng): fine, mixed, superactive, isohyperthermic Fluventic Eutrudepts, moderately deep soil and higher position.

ANALYSIS RESULTS

Profile code No.: SE-17/24

(oven dry basis)

Soil series: Phak Kat series (Pat)

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 water	1:1 KCl				
			sand	silt	clay	vc	c	m	f	vf	result	estim ⁿ					
Pd-1885	0-13	A	28.5	47.5	24.0						l	cl	5.9	5.0	1.9	3.3	117
Pd-1886	13-34	Bt	27.5	26.0	46.5						c	c	5.6	3.8	1.6	1.9	59
Pd-1887	34-74	Btgv1	13.0	18.5	68.5						c	c	5.5	4.2	1.9	1.9	79
Pd-1888	74-100	Btgv2	16.0	20.0	64.0						c	c	5.4	4.0	2.3	1.9	88

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 ₄ OAc (C)	CEC 100g Clay	B/Cx100	(Bx100)/(B+A)				
0-13	3.4	3.11		6.20	5.00	0.20	0.20	11.60	11.00	22.60	16.5	68.8	70	51			0.35	
13-34	4.6	1.17		2.50	4.00	0.10	0.30	6.90	14.80	21.70	16.1	34.6	43	32			0.08	
34-74	6.8	0.78		2.90	6.40	0.20	0.50	10.00	19.20	29.20	23.5	34.3	43	34			0.10	
74-100	4.1	0.66		4.30	7.60	0.20	0.50	12.60	15.60	28.20	24.0	37.5	53	45			0.12	

Surveyor: S. Kitiyarak & C. Chaengprai

Reported by: W. Sirichuaychoo

Date: Jan. 20, 1973

Date: Nov. 24, 1998