

Proposed by P. Vijarnsorn, 1969
Revised by :
P. Vijarnsorn and staffs, 1988
W. Sirichuaychoo, 2004

SU-NGAI PADI SERIES

Field Symbol: Pi

Distribution: Occupies a small extent in Peninsular Thailand.

Setting: Su-ngai Padi soils are formed from alluvium of granite or equivalent rocks and occurred on alluvial fan. Relief is nearly level to gently undulating. Slope ranges from 1 to 3 percent. Elevation is from 10 to 30 m above mean sea level. The climate is Tropical Monsoon (Koppen 'Am'). Average annual precipitation is from 1,800 to 3,000 mm Average annual air temperature is from 26 °C to 28°C.

Drainage, Permeability and Surface Runoff: Drainage is somewhat poorly drained, permeability is estimated to be moderate to slow and surface runoff is medium. The ground water level is below 1.5 m for most of the year. Surface flooding by rainwater occurred for a few days during the peak or the rainy season.

Vegetation and Land Use: Originally under Tropical Evergreen Forest. Now have been cleared for cultivation, para rubber and fruit trees especially bananas, coconuts, durians and rambutans.

Characteristic Profile Features: Su-ngai Padi series is a member of the fine-loamy, siliceous, subactive, isohyperthermic Aeric Paleaquults (soil taxonomy, 2003). They are very deep soils and are characterized by a very dark gray or dark grayish brown sandy loam surface or A horizon overlying a light brownish gray sandy clay loam AB or BA horizon. The upper argillic B horizon is light yellowish brown or very pale brown and becomes white or gray in the lower argillic B horizon. The gravelly sandy clay loam texture in the lower argillic B horizon is characteristic for the soils. Yellowish brown, brownish yellow and strong brown mottles occur in the lower A and the upper B horizon, red or dark red mottles occur in the lower B horizon at depths approximately below 80 cm from the soil surface. The gravel and sand fractions are composed of quartz. 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 5.0 to 5.5.

Typifying Pedon: Su-ngai Padi sandy loam - para rubber plantation, from Moo Ban Thor Lang, Amphoe Ra-ngae, Changwat Narathiwat, 20 m above mean sea level, less than 2 percent slopes.

Profile Code Number: S-71/10d, described by C. Chaengprai, 11 March 1969 (moist colors unless otherwise stated).

Horizon Depth (cm)	Description
Ap 0-18	Very dark gray (10YR3/1) sandy loam; moderate medium blocky structure; slightly sticky and slightly plastic; common medium animal holes; many medium and few large roots; strongly acid (field pH 5.5); clear smooth boundary.
ABg 18-32	Light brownish gray (10YR6/2) sandy clay loam; massive and weak subangular blocky structure; slightly friable, sticky and plastic; common fine tubular pores; common medium roots; very strongly acid (field pH 5.0); clear smooth boundary.
Btcg1 32-48	Light brownish gray (10YR6/2) gravelly sandy clay loam; common medium yellowish brown to strong brown (7.5-10YR5/8) mottles; weak medium subangular blocky structure; sticky and slightly plastic; few thin clay coatings on gravel and in pores; common fine tubular pores; few fine roots; gravels composed of quartz grains; strongly acid (field pH 5.5); clear smooth boundary.
Btcg2 48-64	Light yellowish brown (10YR6/4) gravelly sandy clay; many medium brownish yellow (10YR6/8) and few fine strong brown (7.5YR5/8) mottles; moderate medium subangular blocky structure; sticky and slightly plastic; thick clay

	coatings; many fine and medium tubular pores; gravels composed of quartz grains; few fine roots; strongly acid (field pH 5.5); clear smooth boundary.
BCcg1 64-108	Very pale brown (10YR7/4) gravelly sandy clay; many reddish yellow (7.5YR6/8) and common red (2.5YR4/8) mottles; fine and medium subangular blocky structure; sticky and slightly plastic; few fine roots; gravels composed of quartz grains; strongly acid (field pH 5.5); gradual smooth boundary.
BCcg2 108-150	White (10YR8/1) gravelly sandy clay loam; many medium strong brown (7.5YR5/6) and yellowish brown (10YR5/8) mottles; weak coarse subangular blocky structure; common fine mica; gravels composed of quartz grains; strongly acid (field pH 5.5).

Remark: gravel and quartz grains less than 35% by volume of the soil matrix.

Type Location:

Name of district, Amphoe Su-ngai Padi, Changwat Narathiwat.

Range of Profile Features:

The surface or A horizon sandy loam, has 10 to 20 cm in thickness. Moist color in hues 10YR, values 3 to 5 and chromas 1 or 2. Sandy clay loam may occurred. Structure is moderate medium blocky. Very strongly acid to strongly acid, reaction values range from 5.0 to 6.0.

The argillic B horizon sandy clay loam, has hues 10YR, values 6 or 7 and chromas 2 to 4 in the upper argillic B and 2 or 1 in the lower argillic B horizon. The horizon may have a gravelly sandy clay texture with an average clay content in the control section ranging from 18 to 35 percent. Structure is weak and moderate fine and medium blocky. Very strongly acid to strongly acid, reaction values range from 5.0 to 6.0.

Similar Soil Series:

La Han series (Lh): fine-loamy, siliceous, subactive, isohyperthermic Typic Paleudults, no gravel in the argillic B horizon, moderately well drained.

Visai series (Vi): fine-loamy, mixed, semiactive, isohyperthermic Typic Plinthaquults, has no gravel in the argillic B horizon.

Thung Wa series (Tg): coarse-loamy, siliceous, subactive, isohyperthermic Typic Paleudults, has a better drainage (well drained).

Principal Associated Soils:

These include La Han, Thung Wa, Bangnara and Khok Khain series.

Bangnara series (Ba): fine, kaolinitic, isohyperthermic Typic Paleaquults.

Khok Khain series (Ko): fine-loamy, kaolinitic, isohyperthermic Typic Kandiaquults.

ANALYSIS RESULTS

Profile code No.: S-71/10d

(oven dry basis)

Soil series: Su-ngai Padi series (Pi)

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				
P-1201	0-18	Ap	68.5	16.5	15.0					sl	sl	5.0	4.0	0.0	6.7	24
P-1202	18-32	ABg	64.5	13.0	22.5					scl	scl	5.0	4.2	0.2	3.4	10
P-1203	32-48	Btcg1	57.5	19.5	23.0					scl	gscl	4.7	4.1	0.0	2.8	10
P-1204	48-64	Btcg2	52.0	12.0	36.0					sc	gsc	4.8	4.0	0.3	3.7	10
P-1205	64-108	BCcg1	56.0	8.5	35.5					sc	gsc	5.0	3.8	0.4	2.9	13
P-1206	108-150	BCcg2	13.5	46.5	40.0					cl-c	gscl	5.0	4.0	0.0	3.5	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)	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)				
				0-18	0.8	1.47		0.10	0.01	0.10	0.20	0.41	7.10	7.51	5.2			
18-32	0.7	0.37		0.20	0.01	0.04	0.20	0.45	3.70	4.15	2.4	10.7	19	11			0.01	
32-48	0.1	0.15		0.20	0.01	0.03	0.20	0.44	3.20	3.64	2.1	9.1	21	12			0.01	
48-64	0.1	0.16		0.20	0.01	0.30	0.20	0.71	3.90	4.61	3.5	9.7	20	15			0.01	
64-108	0.1	0.12		0.20	0.01	0.04	0.20	0.45	5.80	6.25	6.3	17.7	7	7			0.01	
108-150	0.1	0.08		0.10	0.01	0.10	0.20	0.41	4.90	5.31	5.6	14.0	7	8			0.01	

Surveyor: C. Chaengprai

Reported by: W. Sirichuaychoo

Date: March 11, 1969

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