

Proposed by U. Pulsawath, 1974
Revised by :
P. Vijarnsorn and staffs, 1988
W. Sirichuaychoo, 2004

PHANG-NGA SERIES

Field Symbol: Pga

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

Setting: Phang-nga soils derived from granite or equivalent rocks and occurred on granitic terrain. Relief is gently undulating to undulating. Slope ranges from 2 to 12 percent. 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 well drained, permeability is estimated to be moderate and surface runoff is medium to rapid depending upon slope and nature of vegetation. Ground water level falls below 1.5 m throughout the year.

Vegetation and Land Use: Tropical Evergreen Forest on steep slope, but many parts are planted to para rubber and fruit trees. Upland crops namely cassava and pineapple are also grown on various parts of south-eastern area.

Characteristic Profile Features: The Phang-nga series is a member of the fine, kaolinitic, isohyperthermic Typic Kandiodults (soil taxonomy, 2003). They are very deep soils and are characterized by a dark brown or brown sandy clay loam surface horizon overlying a strong brown or yellowish brown kandic B horizon. Very strongly acid to moderately acid, reaction values range from 5.0 to 6.5 throughout the soil profile.

Typifying Pedon: Phang-nga sandy clay loam - para rubber plantation, from Ban Bang La, Tambon Pa Khok, Amphoe Thalung Changwat Phuket, 2 to 5 percent slopes.

Profile Code Number: S-63/15, described by U. Pulsawath and staffs, 21 May 1974 (moist colors unless otherwise stated).

Horizon	Depth (cm)	Description
Ap	0-14	Dark grayish brown (10YR4/2) and dark brown (10YR3/3) sandy clay loam; moderate medium and coarse subangular blocky structure; friable, slightly sticky and slightly plastic; many interstitial and common tubular pores; few fine and common roots; moderately acid (field pH 6.0); clear smooth boundary.
BA	14-29	Brown (7.5YR5/4) and brown to dark brown (10YR4/3) sandy clay loam; moderate medium and coarse subangular blocky structure; friable, slightly sticky and slightly plastic; many interstitial and tubular pores; few large and coarse roots; krotovinas; moderately acid (field pH 6.0); gradual smooth boundary.
Bt1	29-67	Strong brown (7.5YR5/6) sandy clay; weak fine and medium subangular blocky structure; friable, sticky and slightly plastic; patchy thin cutan on ped faces; many interstitial and tubular pores; few fine roots; krotovinas; moderately acid (field pH 6.0); diffuse smooth boundary.
Bt2	67-110	Strong brown (7.5YR5/6-8) sandy clay; weak fine and medium subangular blocky structure; friable, sticky and slightly plastic; few fine cutan on ped faces; many interstitial and tubular pores; few fine roots; moderately acid (field pH 6.0).

Type Location:

Name of province, Changwat Phang-nga.

Range of Profile Features:

The surface or A horizon sandy loam or sandy clay loam, is from 10 to 15 cm in thickness and has 10YR or 7.5YR hues, values 3 to 4 and chromas 2 to 4. Structure is weak and moderate

fine subangular blocky. Very strongly acid to strongly acid, reaction values range from 4.5 to 5.5.

The kandic B horizon has 10YR or 7.5YR hues, values 5 or 6 and chromas 6 or 8. However, color of 5YR hue, values 4 or 6 and chromas 6 or 8 may present below 80 cm from the soil surface. Structure is moderate medium and coarse subangular blocky. Mica and feldspars may be observable within the profile, sand grains commonly increase in sizes with depth. Very strongly acid to strongly acid, reaction values range from 4.5 to 5.5.

The multicolored C horizon usually occur below 1.5 m of the surfaces. Weathered granite fragments commonly occur in this horizon.

Similar Soil Series:

Phuket series (Pk): fine, kaolinitic, isohyperthermic Typic Kandiodults, reddish color are present within 80 cm from the soil surface.

Phang-nga series (Pga): fine, kaolinitic, isohyperthermic Typic Kandiodults, 10YR to 7.5YR hues.

Thai Mueang series (Tim): fine, kaolinitic, isohyperthermic Typic Kandiodults, the gravelly layer occurs approximately below 50 cm of the soil surface, gravel are quartz grains. 7.5YR to 10YR 5-7/6-8 and mixed colors.

Principal Associated Soils:

These include Thai Mueang and Khok Kloi series and occurred on higher position and Phuket series on the same terrain. Generally, Phuket and Phang-nga soils do not occur in geographic association, although theoretically the Phuket soils should occur in the higher position.

Khok Kloi series (Koi): fine, kaolinitic, isohyperthermic Typic Kandiodults, the gravelly layer occurs approximately below 50 cm of the soil surface; gravel are quartz grains. 5YR to 2.5YR 5-6/6-8 and mixed colors.

ANALYSIS RESULTS

(oven dry basis)

Profile code No.: S-63/15

Soil series: Phang-nga series (Pga)

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-1422	0-14	Ap	56.0	37.0	7.0						sl	scl	5.1	4.4	0.6	1.9	24
Pe-1423	14-29	BA	66.0	15.5	18.5						sl	scl	4.6	4.2	1.2	2.6	29
Pe-1424	29-67	Bt1	54.5	9.5	36.0						sc	sc	5.0	4.3	0.9	1.9	15
Pe-1425	67-110	Bt2	53.0	7.0	40.0						sc	sc	5.2	4.4	1.2	3.3	12

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 conductivity (ECx10 ⁶) dS m ⁻¹
								SUM	Extr.	SUM	CEC	CEC	B/Cx100	(Bx100)/				
				Ca	Mg	K	Na	cations (B)	acidity (A)	(B+A)	NH ₄ OAc (C)	100g Clay	(B+A)					
0-14	1.6	0.97		0.30	0.40	0.10	0.40	1.20	10.00	11.20	4.3	11.6	28	11			0.18	
14-29	1.5	1.91		0.40	0.10	0.10	0.20	0.80	12.60	13.40	4.5	24.3	18	6			0.13	
29-67	3.4	0.67		0.30	0.30	0.10	0.20	0.90	8.60	9.50	3.1	8.6	29	9			0.08	
67-110	1.6	0.52		0.30	0.20	0.10	0.20	0.80	8.40	9.20	3.2	8.0	25	9			0.07	

Surveyor: U Pulsawath & staff

Date: May 21, 1974

Reported by: W Sirichuaychoo

Date: Nov. 29, 1998