

Proposed by P. Vijarnsorn, 1979
Revised by:
P. Vijarnsorn, 1988
W. Sirichuaychoo, 2004

CHAIYA SERIES

Field Symbol: Cya

Distribution: Occupied a small extent in Peninsular Thailand.

Setting: Chaiya soils are formed from alluvium over marine or brackish deposits on coastal plain (formal tidal flat and occur on transitional zone between alluvium deposits and brackish deposits). Relief is level to nearly level with slope less than 1 percent. Elevation ranges from 5 to 10 m above mean sea level. The climate is Tropical Monsoon (Koppen 'Am'). Average annual precipitation is from 1,500 to 2,500 mm. Average annual air temperature is from 26 °C to 28 °C.

Drainage, Permeability and Surface Runoff: Drainage is poorly drained, permeability is slow and surface runoff is slow. Ground water level depth about 2 meter.

Vegetation and Land Use: Mainly used for transplanted rice.

Characteristic Profile Feature: Chaiya series is a member of the fine-loamy, siliceous, subactive, nonacid, isohyperthermic Fluvaquentic Endoaquepts (Soil Taxonomy, 2003). They are very deep stratified soils and are characterized by a dark grayish brown to gray sandy loam surface or Ap horizon with strong brown mottles overlying stratified gray light brownish gray loam, clay loam, loamy sand or sandy clay loam with yellowish red and strong brown mottles of subsoil. Marine clay may occurred below 1.0 meter from soil surface. Strongly acid to moderately alkaline, reaction values range from 5.5 to 8.0.

Typifying Pedon: Chaiya sandy loam - paddy field, Ban Luk Yang, Tambon Thung, Amphoe Chaiya, Changwat Surat Thani, 5 m above mean sea level, less than 2 percent slopes, 50 cm flooding depth (sheet name Amphoe Chaiya, sheet number 4827 IV, coordinate 225379).

Profile Code Number: S-61/92, described by Sataphon Sintagoon, 16 May 1980 (moist colors unless otherwise stated).

Horizon	Depth (cm)	Description
Apg	0-10	Gray (10YR5-6/1) loam; common fine distinct strong brown (7.5YR5/6) mottles; weak medium and coarse subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; very strongly acid (field pH 5.0); abrupt smooth boundary.
Bg1	10-19	Light brownish gray (10YR6/2) sandy loam; few fine prominent yellowish red (5YR5/8) mottles; moderate medium and coarse angular blocky structure; firm, slightly sticky and slightly plastic; common very fine roots; strongly acid (field pH 5.5); clear smooth boundary.
Bg2	19-33	Light brownish gray (10YR6/2) sandy loam; many fine and medium distinct strong brown (7.5YR5/8) mottles; moderate medium and coarse angular blocky structure; firm, slightly sticky and slightly plastic; common fine roots; strongly acid (field pH 5.5); abrupt smooth boundary.
2Bg3	33-55/59	Light brownish gray (10YR6/2) loam; many medium distinct strong brown (7.5YR5/8) mottles; moderate medium angular blocky structure easily breaking into single grains; firm, slightly sticky and slightly plastic; few fine roots; slightly acid (field pH 6.5); abrupt wavy boundary.
2Cg1	55/59-75	Light brownish gray (10YR6/2) clay; many medium distinct yellowish red (5YR5-6/8) mottles; massive; very sticky and very plastic; common fine roots; slightly acid (field pH 6.5); abrupt smooth boundary.

2Cg2	75-85/95	Light brownish gray (10YR6/2) clay; few medium prominent reddish yellow (5YR6/6) mottles; massive; very sticky and very plastic; one large roots; neutral (field pH 7.0); abrupt wavy boundary.
3Cg3	85/95-105/110	Light gray (10YR7/1) loamy sand; few fine prominent yellowish red (5YR5/8) and few medium distinct brownish yellow (10YR6/6) mottles; slightly sticky and slightly plastic; few fine roots; moderately alkaline (field pH 8.0); abrupt wavy boundary.
4Cg4	105/110-144	Dark brown (7.5YR3/2) sandy clay loam; massive; slightly sticky and slightly plastic; moderately alkaline (field pH 8.0); abrupt wavy boundary.
5Cg5	144-165	Gray (N5/0) and light gray (N7/0) sandy clay (marine clay); massive; slightly sticky and slightly plastic; moderately alkaline (field pH 8.0).

Type Location:

Name of district, Amphoe Chaiya, Changwat Surat Thani.

Ranges of Profile Features:

The surface or Ap horizon loam or sandy loam ranges from 10 to 20 cm in thickness and has 10YR or 7.5YR hues, values 4 to 6 and chromas 1 to 2, strong brown mottles.

The subsoil or cambic B horizon are stratified loam, clay loam, loamy sand or sandy clay loam with color of gray and light gray (10YR 7/1) with yellowish red (5YR 5/8), reddish yellow (5YR 6/6) and strong brown mottles. Strongly acid to neutral, reaction values range from 5.5 to 7.0.

The marine clay C horizon may occurred below 1 meter of gray (N 5/0) but have not sulfidic materials and n -values ≤ 0.7 . Moderately alkaline to strongly alkaline, reaction values range from 8.0 to 8.5.

Similar Soil Series:

Chon Buri series (Cb): fine-loamy, mixed, semiactive, isohyperthermic Typic Endoaqualfs, not stratified soils, sandy clay loam of argillic B horizon and high base saturation.

Principal Associated Soils:

Chaiya series is associated with Pattani and Chon Buri series. Pattani series occurred on the coastal plain, lower part than Chaiya series. Chon Buri series occurred on higher position.

Pattani series: coarse-loamy, mixed, superactive, non-acid, isohyperthermic Sulfic Endoaquepts, has sulfidic materials within 100 cm from the soils surface.

ANALYSIS RESULTS

Profile code No.: S-61/92

(oven dry basis)

Soil series: Chaiya series (Cya)

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				
3255	0-10	Apg	44.9	42.4	12.7	4.4	7.8	8.5	12.7	11.5	l	l	3.9	3.4		7.4	65	
3256	10-19	Bg1	64.8	25.7	9.5	3.3	5.9	6.2	9.9	39.5	sl	sl	4.8	3.9		2.9	33	
3257	19-33	Bg2	69.6	20.2	10.2	20.2	19.7	8.7	9.0	12.0	sl	sl	5.6	3.6		2.7	25	
3258	33-55/59	2Bg3	43.7	33.4	22.9	7.2	8.5	6.9	11.2	9.9	l	l	5.1	4.0		1.7	34	
3259	59-75	2Cg1	21.2	30.1	48.7	0.6	1.1	1.6	3.6	14.3	c	c	5.1	4.4		0.9	91	
3260	75-85/95	2Cg2	22.8	27.6	49.6	1.0	2.3	4.1	9.1	6.3	c	c	5.9	4.6		8.8	104	
3261	95-105/110	3Cg3	89.4	3.5	7.1	4.2	14.8	19.8	33.6	17.0	ls-s	ls	6.8	5.7		1.5	30	
3262	110-144	4Cg4	61.3	9.2	29.5	6.3	12.3	12.1	16.3	14.3	scl	scl	4.7	3.9		6.2	191	

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
				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)			
0-10	0.4	1.17		1.00	0.50	0.10	0.40	2.00	4.70	6.70	4.1	32.3	49	30		0.42	
10-19	0.1	0.37		0.90	0.90	0.10	0.40	2.30	3.00	5.30	3.2	33.7	72	43		0.19	
19-33	0.1	0.04		0.90	1.40	0.10	0.60	3.00	1.30	4.30	2.6	25.5	100	70		0.18	
33-55/59	0.7	0.04		1.30	1.60	0.10	0.60	3.60	3.70	7.30	4.7	20.5	77	49		0.16	
59-75	2.6	0.29		2.60	5.40	0.20	1.90	10.10	5.00	15.10	10.7	22.0	94	67		0.54	
75-85/95	2.4	0.22		2.50	5.90	0.20	2.40	11.00	3.40	14.40	11.7	23.6	94	76		0.25	
95-105/110	2.4	0.20		0.50	0.80	0.10	0.80	2.20	0.20	2.40	1.6	22.5	100	92		0.34	
110-144	2.3	0.38		2.10	5.10	0.50	3.50	11.20	5.70	16.90	10.6	35.9	100	66		1.67	

Surveyor: S. Sinthagoon

Reported by: W. Sirichuaychoo