

Proposed by: C. Changprai - 1969
Revised by: 1. B. Boonsompopphan,
P. Hemsrichart, 1988
2. S. Sukchan, 2004

CHATTURAT SERIES

Field Symbol: Ct

Distribution: Occupies small extent in Northeast Plateau, Central Highland and Central Plain particularly southern and western parts.

Setting: Chaturrat soils are formed from calcareous siltstone, calcareous shale and/or some calcareous fine grain sandstone and occur on partial peneplain. Relief is nearly level to undulating which a range of slope is 1 to 5 percent. Elevation ranges from 180 to 220 m above sea level. The climate is Tropical Savanna (Köppen 'Aw'). Average annual precipitation varies from 1,100 to 1,300 mm. Mean annual air temperature is from 26 to 28°C.

Drainage, Permeability and Runoff: Well drained soils. Permeability is slow. Runoff is slow to medium.

Vegetation and Land Use: Mainly spiny shrubs and mixed deciduous forest. Parts are cleared for upland crops such as kenaf, corn, sorghum and also used for natural pasture.

Characteristic Profile Features: The Chaturrat series is a member of the fine, mixed, active isohyperthermic Typic Haplustalfs. They are moderately deep soils and are characterized by a dark reddish brown or reddish brown silty clay loam or silt loam A horizon, overlying a reddish brown or red clay or silty clay argillic B horizon. Weathering parent rock occur at some depth below 50 cm but within 1 m. Reaction is slightly acid to moderately alkaline throughout the profile.

Typifying Pedon: Profile code no. is NE-S-19/11 (moist colors unless otherwise stated).

Location: at km 70, west side of the road from Sikhio to Chaiyaphum, Amphoe Chaturrat Changwat Chaiyaphum

Sheet Name: -

Sheet No.: 5357 I

Coordinate: 803/17.12

Elevation: 180-220 m

Relief: nearly level to undulating

Slope: 1-5%

Physiography: upper part of peneplain

Parent material: residuum and local colluvium from calcareous siltstone, calcareous shale and/or some calcareous fine grain sandstone

Drainage: well drained

Permeability: slow

Runoff: slow to medium

Ground water depth: >2.0 m

Flooding depth: -

Duration: -

Frequency: -

Annual rainfall: 1,100-1,300 mm

Mean temp: 26-28 °C

Climate type: Tropical Savannah

Natural vegetation and/or land use: mainly spiny shrubs and mixed deciduous forest. Parts are cleared for upland crops and also natural pasture

Described by: S. Kittayarak

Date: 21 January 1969

Revised by:

Horizon	Depth (cm)	Description
A	0-7	Dark reddish brown (5YR 3/3) silt loam; moderate medium subangular blocky structure; slightly firm, sticky, slightly plastic; many fine roots; few fine hard subrounded iron-manganese nodules; mildly alkaline (field pH 7.5); gradual, smooth boundary.
Bt1	7-16	Reddish brown (2.5YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; slightly firm, sticky, plastic; common patchy spots of dark reddish brown (5YR 3/3) on ped faces; common patchy thin clay coating on ped faces; few fine interstitial pores; many fine roots; few

		fine hard subrounded iron-manganese nodules; mildly alkaline (field pH 7.5); clear, smooth boundary.
Bt2	16-43	Reddish brown (2.5YR 4/4) clay; strong coarse subangular blocky breaking into fine and medium subangular blocky structure; extremely hard, sticky, plastic; cracking; many broken moderately thick clay coating on ped faces; some shifting fine sand and silt coated on ped faces at upper part of the horizon; common fine tubular and interstitial pores; common fine hard subrounded iron-manganese nodules; slightly acid (field pH 6.5); gradual, smooth boundary.
BC	43-54	Red to dark red (2.5YR 3-4/6) silty clay loam; massive to weak coarse subangular blocky structure; very firm, slightly sticky, slightly plastic; common fine black spots of iron-manganese concretion; slightly acid (field pH 6.5); clear, smooth boundary.
Cr	54-120	Dark red (2.5YR 3/6) silty clay loam with about 80 percent of siltstone and shale fragment content; neutral (field pH 7.0).

Type Location: The initiate pedon were first described at Amphoe Chaturat Changwat Chaiyaphum

Range of Profile Features:

The thickness of an A or Ap horizon varies from 5 to 20 cm and has 5YR or 7.5YR hues, values of 3 to 5 and chromas of 2 to 4. The texture of clay loam type may occur. Structure is moderate fine to medium blocky. The pH values vary from 6.5 to 8.0.

The B horizon has 2.5YR or 5YR hues, values of 3 to 5 and chromas of 4 to 8. Texture of silty clay loam with clay content 35% or more may occur. Structure is moderate fine to coarse blocky. Secondary lime concretion and/or powdery lime may occur in the subsoils. The pH values are from 6.0 to 8.0.

The C or R horizon occur at some depth below 50 cm but within 1.00 m and has multicolored in weathering zone. The pH values usually go up to 7.0 or 8.0.

Similar Soil Series:

Lam Narai series (Ln): are formed from limestone and basalt and contains more lime concretion.

Sikhio series (Si): are formed from old alluvium overlying a calcareous sandstone.

Principal Associated Soils: These include Sung Noen and Sikhio series that usually on the higher position.

ANALYSIS RESULTS

Profile code no.: NE-S-19/11

(oven dry basis)

Soil series : Chaturat (Ct)

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 ¹	water	KCl				
	0-7	A	18.7	59.4	21.9							sil	sil	7.8	6.8	0.9	9.5	215
	7-16	Bt1	16.5	51.9	31.6							sicl	sicl	7.5	6.2	0.8	5.8	114
	16-43	Bl2	11.1	33.4	55.5							c	c	6.2	4.3	0.9	8.5	192
	43-54	BC	16.1	52.3	31.6							sicl	sicl	6.4	5.5	0.6	43.6	169
	54-120	Cr	11.7	54.8	33.5							sicl	sicl	6.6	5.8	1.7	95.9	201

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations (cmol _(c) kg ⁻¹)								Base satur ¹ (%)		ECEC cmol _(c) kg ⁻¹ (B+D)	Al KCl extr. cmol _(c) kg ⁻¹ (D)	Electrical conduct ¹ (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	4.6	1.01		15.30	6.30	0.30	0.30	22.23	1.80	24.00	17.70	80.8	100	93			0.11
7-16	6.0	0.61		10.10	6.70	0.10	0.50	17.40	3.70	21.10	18.90	59.8	92	82			0.02
16-43	5.5	0.33		11.50	11.00	0.20	1.00	23.70	9.40	33.10	28.80	51.9	82	72			0.01
43-54	3.7	0.18		14.50	12.40	0.20	1.20	28.30	5.00	33.30	31.10	98.4	91	85			0.02
54-120	4.4	0.27		17.50	13.10	0.30	1.30	32.20	4.50	36.70	32.90	98.2	98	88			0.03