

Proposed by R.L. Pendleton, 1953
Revised by:
1. C. Changprai, 1987
2. S. Udomsri, 2004

ONGKHARAK SERIES

Field Symbol: Ok

Distribution: Occupies small extent in the southern part of the Central Plain, mainly in Changwat Nakhon Nayok.

Setting: Ongkharak soils are formed from marine sediments mixed with riverine alluvium under brackish water influence. They occur in former tidal flats or alluvium plain which grade down to marine deposits and now free of tidal flooding which have been in cultivation for some time. Relief is flat. Slope is about 0-1%. Elevation ranges from 1-3 m above sea level. The climate is Tropical Savanna (Köppen 'Aw'). Mean annual precipitation is about 1,400 mm. Mean annual temperature is 27 °C.

Drainage, Permeability and Surface Runoff: Poorly drained. Runoff and permeability are slow. Deep surface flooding to depths of 1 m or more from river water or rain occurs for about six to seven months during the rainy season. Sometimes this area flooded by irrigation. The groundwater level falls to about 100 cm During the peak of the dry season and the soil cracks.

Vegetation and Land Use: Mainly used for broadcast rice cultivation. Rushes and sedges occur in places where the soils are too acid for cultivation.

Characteristic Profile Features: Ongkharak series is a member of the Very-fine, mixed, semiactive, acid, isohyperthermic Sulfic Endoaquepts. They are deep, extremely acid soils and are characterized by a black or very dark gray clay A horizon overlying a grayish brown to brown clay B horizon, which in turn overlies a dark gray, reduced clay C horizon approximately 150 cm from the soil surface. The soils are mottled throughout with strong brown and yellowish red coatings along root channels in the A horizon, and prominent red, strong brown mottles in the B horizon. Yellow jarosite mottles occur within 50 cm of the soil surface and are diagnostic for the series. Pressure faces and slickensides occur in the B horizon and the soil cracks at the surface when dry.

Typifying Pedon: Profile code number is 2

Location: Klong 10, 3 km North of Amphoe Nong Sua, Amphoe Nong Sua Changwat Pathum Thani.

Sheet Name: Amphoe Nong Sua

SheetNo.: 5137 II

Coordinate: 316889

Elevation: 2 m MSL.

Relief: level to nearly level

Slope: 0-1%

Physiography: former tidal flats or alluvium plain

Parent material: marine sediments mixed with riverine alluvium under brackish water influence

Drainage: poorly drained

Permeability: slow

Runoff: slow

Ground water depth: 1.4 m

Flooding depth: 15-20 cm

Duration: 2-3 month

Frequency: every year

Annual rainfall: 1,244.2 mm

Mean temp: 27.9 °C

Climate type: Tropical Savannah

Natural vegetation and/or land use: paddy field

Other:

Described by: S. Panichapong & P. Vijarnsorn

Date: 21 January, 1981

Revised by: S. Udomsri

Horizon	Depth (cm)	Description
Apg	0-14	Dark grayish brown (10YR3-4/2) clay; common fine prominent yellowish red (5YR5/8) mottles along root channels; weak medium and coarse subangular blocky structure; extremely hard, very firm, very sticky, very plastic; many fine roots; extremely acid (field pH 4.0); abrupt, smooth boundary.

BAg	14-30	Grayish brown (10YR5/2) clay; many medium to coarse prominent red (10R4/6) and common fine distinct strong brown (7.5YR5/6) mottles; weak medium subangular blocky structure to massive; firm, very sticky, very plastic; common fine roots; patchy organic matter coatings; very strongly acid (field pH 4.5); clear, smooth boundary.
Bssjg	30-60	Grayish brown (10YR5/2) clay; many medium and coarse distinct strong brown (7.5YR5/8) and common medium prominent red (10R4/8) mottles; common fine streaks of jarosite, yellow (2.5YR8/6) at the upper part and few at the lower part of the horizon; massive; very sticky, very plastic; few fine roots; patchy organic matter coatings; distinct slickensides; extremely acid (field pH 4.0); diffuse, smooth boundary.
Bjg	60-115	Brown (7.5YR5/2) clay; many medium distinct strong brown (7.5YR5/8) and few fine prominent red (10 R4/8) mottles (streaks); many medium streaks of jarosite, yellow (2.5Y8/6); massive; very sticky, very plastic; few fine roots; extremely acid (field pH4.0); clear, smooth boundary.
BCg	115-165	Brown (7.5YR5/2) clay; few fine distinct yellowish brown (10YR5/4) mottles; few fine jarosite mottles (in places); massive; very sticky, very plastic; few fine decayed roots and other plant residues; extremely acid (field pH 4.0); clear, smooth boundary.
Cg1	165-195	Gray (10YR5/1) nearly ripe clay; few decayed plant residues; very strongly acid (field pH 4.5).
Cg2	195-360	Gray to dark gray (5Y4-5/1) unripe clay; few decayed plant residues; neutral (field pH 7.0).

Remark: Pedon No. 2 from *Characteristics of Some Acid Sulphate Soils in Thailand*. in the tour guide for 2nd Symposium on Acid Sulphate Soils in Thailand, 18-24 January, 1981, Bangkok, Thailand, Soil Survey Division, Department of Land Development, Bangkok, Thailand.

Type Location: Name of Amphoe, Amphoe Ongkharak Changwat Nakhon Nayok

Range of Profile Features:

The A horizon is from 10 to 25 cm thick, has 10YR hue, values of 2 to 4 and chromas of 2 or less. Structure is moderate to weak, coarse blocky and crumb in places. Field pH values range from 4.5 to 5.0.

The B horizon has 10YR or 7.5YR hues, values of 4 or 5 and chroma of 2 or less. Structure is moderate coarse, breaking to fine blocky and field pH values are usually less than 4.5.

The C horizon is a clay often containing a high content of undecomposed organic material with dark gray 5Y 4/1 or 10YR 4/1 colours and may contain few brown mottles in the upper layers. The soil is half ripe to nearly unripe and has field pH values of 4.5 rising to 6.0 or more below approximately 2 m from the soil surface.

Similar Soil Series:

Rangsit series (Rs): has a similar profile, but contains yellow jarosite mottles between 50-100 cm of the soil surface.

Thanyaburi series (Tan): has a similar profile, but contain jarosite mottles between 50-100 cm of the soil surface and without red mottles.

Sena series (Se): has a similar profile, but contains gypsum crystals in the B horizon and jarosite mottles between 50-100 cm of the soil surface.

Maha Phot series (Ma): has a similar profile, but contains jarosite mottles more than 100 cm of the soil surface.

Principal Associated Soils: These include Rangsit, Thanyaburi and Maha Phot series occupying similar positions on the former tidal flats.

ANALYSIS RESULTS

Profile code No. 2

(oven dry basis)

Soil series : Ongkharak (OK)

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			
33810	0-14	Apg	1.2	43.3	55.5						c	c	3.9	3.2		6.0	367
33811	14-30	BAg	4.3	33.0	62.7						c	c	3.6	3.0		2.0	226
33812	30-60	Bssjg	3.1	29.4	67.5						c	c	3.5	3.0		1.0	257
33813	60-115	Bjg	2.5	27.3	70.2						c	c	3.4	2.9		1.0	296
33814	115-165	BCg	1.5	23.9	74.6						c	c	3.5	3.0		10.0	359
33815	165-195	Cg1	1.4	28.4	70.2						c	c	3.5	3.1		32.0	421
33816	195-315	Cg21	0.6	19.7	79.7						c	c	4.0	3.6		24.0	577
33817	315-335	Cg22	1.2	32.8	66.0						c	c	4.1	3.6		21.0	593
33818	335-360	Cg23	1.5	27.1	71.4						c	c	5.1	4.7		32.0	620

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations (cmol ₍₊₎ kg ⁻¹)								Base satur ¹ (%)				ECEC (B+D) cmol ₍₊₎ kg ⁻¹	Al KCl extr. cmol ₍₊₎ kg ⁻¹ (D)	Electrical conduct ¹ (ECx10 ⁶) dS m ⁻¹	
				Ca		Mg		K		Na		SUM	CEC	CEC	B/Cx100				(Bx100)/
				(B)	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)	(A)	(B)	(A)				(B)
0-14		1.29	0.13	4.36	5.05	0.94	1.90	12.25	19.82	32.07	19.49	35.1	63	38			1.49		
14-30		0.49	0.06	4.36	5.86	0.58	1.84	12.64	23.52	36.16	20.69	33.0	61	35			1.89		
30-60		0.33	0.05	4.39	7.43	0.66	3.00	15.48	22.18	37.66	22.22	32.9	70	41			2.68		
60-115		0.16	0.04	4.73	8.97	0.76	1.00	15.46	21.50	36.96	22.55	32.1	69	42			3.52		
115-165		1.03	0.05	4.83	10.11	0.92	2.00	17.86	25.87	43.73	25.77	34.5	69	41			4.40		
165-195		3.42	0.07	5.26	11.62	1.08	3.00	20.96	27.05	48.01	28.01	39.9	75	44			5.54		
195-315		3.02	0.07	9.90	24.52	1.48	7.00	42.90	14.78	57.68	27.68	34.7	100	74			6.95		
315-335		4.16	0.07	10.22	24.01	1.52	7.00	42.75	12.43	55.18	29.87	45.3	100	77			6.24		