

Proposed by P. Vijarnsorn, 1984
Revised by :
P. Vijarnsorn and staffs, 1988
W. Sirichuaychoo, 2004

NARATHIWAT SERIES

Field Symbol: Nw

Distribution: Occupies on Peninsular Thailand and and some areas in Southeast Coast of Thailand.

Setting: Narathiwat soils are organic soil materials and occurred on the swampy areas along the coastal region, especially in Changwat Narathiwat. Commonly, swamp areas occurred between sand bar or sand dune. Relief is level. Slopes is less than 1 percent. Elevation ranges from 1 to 2 m above mean sea level. The climate is Tropical Rain Forest (Koppen 'Af'). Average annual precipitation is 2,500 to 2,800 mm Average annual air temperature is from 26 to 28°C.

Drainage. Permeability and Surface Runoff: Drainage is very poorly drained, permeability is slow to moderate and surface runoff is slow.

Vegetation and Land Use: The natural vegetation are fresh water swamp forest such as *Melaleuca leucadendron*, ferns, reeds and sedges. In some part cleared forest and drained water out for rice cultivation.

Characteristic Profile Features: Narathiwat series is member of the dysic, isohyperthermic Typic Haplofibrists (soil taxonomy, 2003). They are very deep organic soils materials, more than 100 cm depth from the soil surface, fibric material with soil reaction less than 4.5 (extremely acid) throughout the profile. In lower parts of organic materials are inorganic soils which high sulphur content (sulfidic soil materials).

Typifying Pedon: Narathiwat fibric organic soil materials, cleared forest (*Melaleuca leucadendron*, sedges, reeds and ferns), from central part of Bacho swamp, Amphoe Muang, Changwat Narathiwat. The thesis submitted to the University of Tokyo*, 10 to 100 cm flooding depth, less than 50 cm ground water depth.

Profile Code: Pedon No. S7, described by Pisoot Vijarnsorn, 12 March 1984 (moist colors unless otherwise stated).

Horizon	Depth (cm)	Description
Oig1	0-4	Black (7.5YR2/0) unrubbed and rubbed, fibric materials (burnt) about 70% fiber; most remain consisting of roots; many charcoal fragments (irreversible drying); fine subangular blocky structure; hard, nonsticky and nonplastic; not react with α -dipyridyl and bentizine; sodium pyrophosphate test paper is pinkish gray to pink (7.5YR7/2-4); extremely acid (field pH 4.0).
Oeg	4-15	Dark reddish brown (5YR3/2) unrubbed and rubbed, fibric materials about 50% fiber; most remain consisting of roots and woody fragments; massive; nonsticky and nonplastic; not react with α -dipyridyl and bentizine; sodium pyrophosphate test paper is light brown (7.5YR6/4); very strongly acid (field pH 4.5).
Oig2	15-30	Black (5YR2.5/1) unrubbed and rubbed, fibric materials about 70% fiber; most remain consisting of roots; massive; nonsticky and nonplastic; not react with α -dipyridyl and bentizine; sodium pyrophosphate test paper is pink (7.5YR7/4); very strongly acid (field pH 4.5).
Oig3	30-90	Dark reddish brown (5YR2.5/2) unrubbed and rubbed, fibric materials about 50% fiber; most remain consisting of fine roots and easy to be rubbed; massive; nonsticky and nonplastic; not react with α -dipyridyl and bentizine; sodium pyrophosphate test paper is pink (7.5YR8/4); very strongly acid (field pH 4.5).
Oig4	90-140	Dark reddish brown (5YR3/2) unrubbed and rubbed, fibric materials about 52% fiber; most remain consisting of fine roots, some as coarse as 2 cm partially decayed and easy to be rubbed; massive; nonsticky and nonplastic; not react with α -dipyridyl and bentizine; sodium pyrophosphate test paper is pinkish white (7.5YR8/2); very strongly acid (field pH 4.5).

Oig5 140-200 Dark reddish brown (5YR2.5/2) unrubbed and rubbed, fibric materials about 68% fiber; most remain consisting of roots and wood fragments about 2-4 cm; massive; nonsticky and nonplastic; not react with α -dipyridyl and bentzine; sodium pyrophosphate test paper is pinkish white (7.5YR8/2); very strongly acid (field pH 4.5).

Remark: *Pisoot Vijarnsorn, 1985. Characterization, genesis, classification and agricultural potential of peat and saline/acid sulphate soils of Thailand. A thesis submitted to the university of Tokyo, in partial fulfillment of the requirement for the degree of Doctor of Philosophy, 1985.

Type Location:

Name of Province, Changwat Narathiwat.

Range of Profile Features:

Narathiwat series is organic soil material which has organic material more than 100 cm thick from the soil surface (O horizon), dominantly fibric material in subsurface tier (within 40 cm from the surface).

Sub layer (C horizon) of organic materials are marine sediment which high sulfur content (> 0.75 percent total sulfur).

Similar Soil Series:

Kab Daeng series (Kd): loamy, mixed, superactive, dysic isohyperthermic Terric Sulphemists, organic soil materials 40 to 100 cm thick from the soil surface.

Principal Associated Soils:

Narathiwat series is associated with Kab Daeng, Munoh, Ra-ngae and Thon Sai series. Narathiwat soils occurred on the depression but the associated soils occurred on the marginal of depression.

Munoh series (Mu): fine, mixed, semiactive, acid, isohyperthermic Sulfic Endoaquepts.

Ra-ngae series (Ra): very-fine, mixed, superactive, acid, isohyperthermic Sulfic Endoaquepts.

Thon Sai series (Ts): fine-loamy, mixed, semiactive, acid, isohyperthermic Sulfic Endoaquepts.

ANALYSIS RESULTS
(oven dry basis)

Profile code No.: No.7 (thesis)
Soil series: Narathiwat series (Nw)

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					
	0-4	Oig1										fibric	3.6	2.4		36.8	128
	4-15	Oeg										hemic	3.4	2.7		85.0	217
	15-30	Oig2										fibric	3.4	2.1		40.5	219
	30-90	Oig3										fibric	3.5	2.4		28.2	191
	90-140	Oig4										fibric	3.6	2.4		10.8	70
	140-200	Oig5										fibric	4.8	3.8		9.4	47

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)
				0-4	14.3	46.64	1.91	10.80	4.60	0.40	1.50	17.30	121.30				138.60
4-15	14.8	52.23	1.48	5.90	7.50	0.90	1.70	16.00	125.60	141.60	171.3		9	11		0.17	
15-30	20.2	73.41	1.10	1.60	6.00	0.70	2.50	10.80	167.20	178.00	179.7		6	6		0.21	
30-90	15.6	57.39	1.02	1.90	4.70	0.60	2.30	9.50	122.70	132.20	146.5		6	7		0.18	
90-140	11.5	69.30	1.01	2.60	6.70	0.20	2.30	11.80	63.30	75.10	117.8		10	16		0.18	
140-200	5.9	66.54	1.15	4.60	25.70	0.20	2.70	33.20	99.50	132.70	133.5		25	25			

Surveyor: Pisoot Vijarnorn

Reported by: W. Sirichuaychoo

Date: March 12, 1984

Date: Nov. 2, 1998