

Proposed by P. Vijarnsorn, 1982
Revised by :
P. Vijarnsorn and staffs, 1988
W. Sirichuaychoo, 2004

MUNOH SERIES

Field Symbol: Mu

Distribution: Occupies a small extent in Peninsular Thailand and some areas in Southeast Coast of Thailand.

Setting: Munoh soils are marine clay sediment and occurred on coastal plain (the marginal land of swampy areas and swampy areas after artificially drained for agricultural used until very shallow organic soil material, 5 to 10 cm thick). Relief is level. Slope is less than 1 percent. Elevation is less than 5 m above mean sea level. The climate is Tropical Rain Forest (Koppen 'Af'). Average annual precipitation is from 2,500 to 3,000 mm. Mean annual air temperature is from 26°C to 28°C.

Drainage. Permeability and Surface Runoff: Drainage is poorly drained, permeability is moderately slow and surface runoff is slow. Ground water level about 70 to 100 cm below the soil surface in dry season.

Vegetation and Land Use: paddy field, grasses and sedges.

Characteristic Profile Features: Munoh series is a member of the fine, mixed, semiactive, acid, isohyperthermic Sulfic Endoaquepts (soil taxonomy). They are very deep soils and are characterized by mixed black, very dark gray and/or gray loam surface or A horizon overlying gray or light gray clay with jarosite mottles between 50 to 100 cm from surface of cambic B horizon and brownish mottles over marine greenish clay C horizon within 100 cm. Extremely acid to very strongly acid, reaction values range from 3.5 to 5.0.

Typifying Pedon: Munoh series loam - paddy field, from Experimental field in Pikunthong Center, Amphoe Muang, Changwat Narathiwat. Second International Soils Management Workshop*, less than 5 m above mean sea level, 20 to 50 cm flooding depth, shallower than 1 meter ground water depth.

Profile Code Pedon: No. 2, described by Pisoot Vijarnsorn (moist colors unless otherwise stated).

Horizon	Depth (cm)	Description
Ap	0-18	Mixed black (10YR2/1) and dark brown (10YR4/3) loam; humusify; weak granular structure; sticky and plastic; many fine roots; many charcoal fragments; strongly react with α -dipyridyl but not bentizine; extremely acid (pH 3.8); clear wavy boundary.
Bg1	18-37	Mixed light gray (10YR6/1) light brownish gray (10YR6/2) yellowish brown (10YR5/6) and dark gray (10YR4/1-2) silty clay loam; prismatic structure; sticky and plastic; many fine and medium roots; common fine mica flakes; organic matter coating along cracks; strongly react with α -dipyridyl but not bentizine; extremely acid (pH 3.7); clear wavy boundary.
Bg2	37-63	Brown (7.5YR5/2-4) clay loam to silty clay loam; indicating buried A, few yellow (2.5Y7/6) jarosite mottles and common fine strong brown (7.5YR5/6) mottles along roots channels; weak coarse and very coarse prismatic structure; sticky and plastic; patchy very dark gray (7.5YR3/0) organic matter (leaf fossil); strongly react with α dipyridyl but not bentizine; extremely acid (pH 3.6); clear wavy boundary.
Bg3	63-80	Mixed dark grayish brown (10YR4/2) and olive gray (5Y4/2) very ripening clay loam (silty clay loam); many yellow (2.5Y7/6) jarosite mottles patchy along root; massive and weak very coarse prismatic structure; sticky and plastic; many fine and medium brown (7.5YR4/4) roots, partially decayed; some sand pocket; strongly react with α -dipyridyl but not bentizine; extremely acid (pH 3.6); clear irregular boundary.

Cg1	80-110	Mixed dark gray (5Y4/1) and olive gray (5Y4/2) half ripe silty clay loam; massive; sticky and plastic; many fine and medium roots, partially decayed; many fine mica flakes; strongly react with α -dipyridyl but not bentizine; extremely acid (pH 3.6); clear irregular boundary.
Cg2	110-150	Mixed dark gray (5Y4/1) and olive gray (5Y4/2) unripe (half ripe) silty loam; massive; sticky, plastic; many fine and medium roots, partially decayed; many fine mica flakes; strongly reduced, strongly react with α -dipyridyl but not bentizine; strongly acid (pH 5.1).

Remark: This profile is Second International Soil Management Workshop.

Type Location:

The name of Village, Ban Munoh, Amphoe Tak Bai, Changwat Narathiwat.

Range of Profile Features:

The surface or A horizon loam, silt loam to clay loam ranges from 10 to 20 cm in thickness and has 10YR hues, values 2 to 4 and chromas 1 to 3. Extremely acid to strongly acid, reaction values range from 4.0 to 5.5.

The upper Bg horizon is 10YR or 7.5YR hues, values 5 to 6 and chromas 1 to 2 with brownish and yellowish mottles. Extremely acid to very strongly acid, reaction values range from 4.0 to 4.5. The lower Bg horizon is occurred about 50 to 100 cm with has properties the same as the upper Bg horizon but has straw yellow mottles (jarosite) in the horizon.

The C horizon is occurred between 50 to 100 cm, has 5Y or GY colored. This horizon is marine clay with high sulfur content (sulfidic material occurred within 150 cm).

Similar Soil Series:

Ra-ngae series (Ra): fine, mixed, superactive, acid, isohyperthermic Sulfic Endoaquepts, not have jarosite mottles but have sulfidic material within 100 cm from the surface.

Thon Sai series (Ts): fine-loamy, mixed, semiactive, acid, isohyperthermic Sulfic Endoaquepts, not have jarosite mottles but have sulfidic material within 100 cm from the surface.

Principal Associated Soils:

The Munoh series is associated with Ra-ngae, Kab Daeng and Narathiwat series. Munoh series occurred higher position than Ra-ngae, Kab Daeng and Narathiwat series.

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

Narathiwat series (Nw): dysic, isohyperthermic Typic Haplofibrists, organic soil materials more than 100 cm thick from the soil surface.

ANALYSIS RESULTS
(oven dry basis)

Profile code No.: No.2 (Workshop)
Soil series: Munoh series (Mu)

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				
	0-18	Apg	10.4	75.4	14.2							sil	l	4.3	4.1		68.5	101
	18-37	Bg1	28.5	38.7	32.8							cl	sicl	4.0	3.6		7.3	40
	37-63	Bg2	24.7	33.2	42.1							c	cl-sicl	3.8	3.5		8.4	46
	63-80	Bg3	21.7	37.2	41.1							c	ripe-cl	3.0	2.8		10.0	25
	80-110	Cg1	20.8	52.3	26.9							sil	half ripe-sicl	2.4	2.4		15.1	12
	110-150	Cg2	31.7	43.0	25.3							cl	unripe-sil	2.6	2.3		18.2	16

Depth (cm)	Air dried to oven dried	C %	N %	Exchange capacity and cations (cmol ₍₊₎ kg ⁻¹)									Base satur ⁿ (%)		ECEC (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)			
0-18	11.1	4.90	0.95	0.30	1.50	0.30	1.00	3.10	32.90	36.00	34.3	241.5	9	9			0.55
18-37	2.0	1.25	0.04	1.00	1.10	0.10	0.30	2.50	10.20	12.70	7.7	23.5	32	20			0.21
37-63	2.5	1.85	0.05	0.80	1.30	0.10	0.40	2.60	12.60	15.20	8.8	20.9	30	17			0.83
63-80	4.0	3.55	0.08	1.30	1.90	0.06	0.50	3.76	25.90	29.66	13.9	33.8	27	13			2.05
80-110	6.2	5.30	0.10	0.90	4.20	0.03	0.10	5.23	40.40	45.63	13.3	49.4	39	11			6.12
110-150	4.9	4.95	0.09	1.90	5.40	0.03	0.20	7.53	34.60	42.13	13.0	51.4	58	18			0.52

Surveyor: Pisoot Vijarnsom

Reported by: W. Sirichuaychoo

Date:

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