筑波実験植物園研報　17：101-103, 1998.
Ann. Tsukuba Bot. Gard.

# A Study of Mountain Soils of Espiritu Santo, Vanuatu

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Vanuatu consists of about 80 volcanic islands which are located on the margin of the Pacific/Australian plate. Espiritu Santo is the biggest one in Vanuatu. It have Mt. Tabwemasana which is the heighest point, 1879m, in Vanuatu.

The soil of Espiritu Santo, according to Quantain(1969, 1975), is Ando-soils which is volcanic origin and poorly developed soils in mountain.

Our investigation sites are western mountain range on southwest of Espiritu Santo. Root 1 for investigation is to Mt.Tabwemasana (1879m), Root 2 is to Mt. Vutimele (1535m).

Soil profile description

A. Root 1 to Mt. Tabwemasana.

Profile Number : 1

Location: point near the 1st base camp

Elevation: 200m

Land form: Steep

Vegetation: N.D

Description of the Profile

A 0-8 cm; Brownish black (10YR 2/2); sandy loam (SL); strong medium granular and moderate medium subangular blocky; very high organic matter; no mottling; abundant angular stone; loose; many pores; moderately dry; many fine roots; clear smooth boundary.

B 8-27 cm; Brownish black (10YR 2/2); loam (L); strong medium, moderate medium granular and moderate medium subangular blocky; high organic matter; no mottling; abundant angular stone; hard; many pores; moderately dry; many fine roots; clear smooth boundary.

BC 27-60cm +; Dark brown (10YR 3/3); sandy loam (SL); medium subangular blocky, moderate medium granular; medium organic matter; no mottling; abundant angular stone; hard; few pores; moderately dry; many very fine and fine roots and few coarse roots.

Profile Number : 2

Location: point near the 2nd base camp

Elevation: 1132 m

Land form: gently sloping

Vegetation: mossy forest

Description of the Profile

A 0-10cm; Black (7.5YR 2/1); loam (L); fine crumb, fine granular; high organic matter; no mottling; no gravel; hardness (12-15); very many pores; moist; many very fine, fine roots and few medium roots; clear smooth boundary.

AB 10-22cm; very dark brown (7.5YR 2/3); clay loam (CL); medium subangular blocky; high

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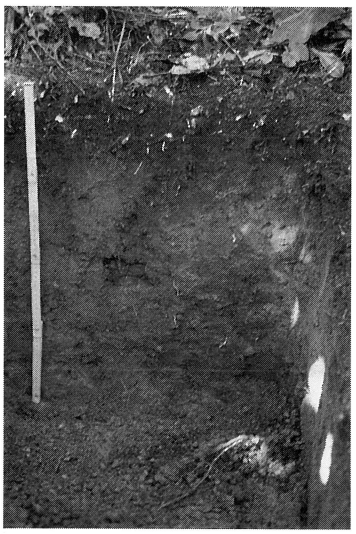
organic matter; no mottling; no gravel; hardness (19-21); many pores; moist; common very fine, fine roots; difuse smooth boundary.

B 22-55cm; dark brown (7.5YR3/4); clay loam (CL); subangular, angular blocky; no mottling; no gravel; hardness (18-21); pore common; moist; fine root common; gradual smooth boundary.

BC 55-65cm+; dark brown (7.5YR3/4); clay loam (CL); angular blocky; no mottling; no gravel; hardness (15-18); no pores; moderately moist; no root.



Photograph. Soil Profile No. 2.

B. Root 2 to Mt. Vutimele.

Profile Number : 3

Location: point near the 1st base camp

Elevation: 500m

Land form: steep sloping

Vegetation: tree ferns and bamboo grove

Description of the Profile

A1 0-5cm; brownish black (7.5YR2/2); loam (L); crumb, fine granular; high organic matter; no mottling; no gravel; hardness (12-15); very many pores; moderately dry; fine many roots; gradual smooth boundary.

A2 5-15cm; very dark brown (7.5YR 2/3); loam (L); granular, subangular blocky; high organic matter; no mottling; no gravel; hardness (15-17); many pores; moderately dry; few fine roots; gradual smooth boundary.

B1 15-30cm; dark brown (7.5YR3/3); loam (L); subangular, angular blocky; few organic matter; no mottling; no gravel; hardness (20); few pores; moderately dry; few fine roots; gradual smooth boundary.

B2 30-50cm; dark brown (7.5YR3/4); sandy (S); weak subangular blocky; low organic matter; no mottling; many gravel; dry; no root; clear smooth boundary.

BC 50-65cm+; dark brown (7.5YR3/4): dull yellowish brown (10YR4/3) = 6:4; sandy(S); massive; low organic matter; no mottling; abundant medium gravel; hardness(25); no pores; dry; no root.

Profile Number : 4

Location: intermediate point of 1st to 2nd base camp

Elevation: 820 m

Land form: steep slope

Vegetation: Kauri tree

Description of the Profile

A0 −0-4cm; H

A1 0-2cm; brownish black (10YR2/3); clay loam (CL); crumb structure; very high organic matter; no mottling; no gravel; very loose; very many pores; moist; many fine, medium roots; clear smooth boundary.

AB 2-15cm; dark brown (10YR 3/3); clay loam (CL); medium subangular blocky structure; high organic matter; no mottling; no gravel; soft; many pores; moist; few fine, medium roots; diffuse smooth boundary.

B 15-40cm; dark brown (10YR 3/3); clay loam (CL); weak subangular blocky structure; medium organic matter; no mottling; no gravel; soft; many pores; moist; few fine, medium roots; diffuse smooth boundary.

BC 40-60cm+; brown (10YR 4/4); clay (C); weak subangular blocky structure; low organic matter; no mottling; no gravel; soft; pores common; moist; few coarse roots.

Profile Number : 5

Location: near the 2nd base camp

Elevation: 1100 m

Land form: steep slope

Vegetation: mossy forest (tree ferns and palms)

Description of the Profile

A0 0-0cm; very thin

A1 0-12cm; brownish black (7.5YR 2/2); loam(L); crumb structure; very high organic matter; no mottling; no gravel; very loose; many pores; moist; many very fine roots; gradual smooth boundary.

A3 12-30cm; brownish black (7.5YR 2/2); clay loam(CL); subangular, crumb structure; high organic matter; no mottling; no gravel; loose; many pores; moist; very fine, fine, medium roots; gradual smooth boundary.

Photograph. Soil Profile No. 5.

B1 30-50cm; dark brown (7.5YR3/3); clay loam(CL); subangular structure; many organic matter; no mottling; no gravel; soft; few pores; moist; fine, medium roots; clear smooth boundary.

B2 55-75cm; dark brown (7.5YR3/4); clay loam(CL); weak subangular blocky structure; medium organic matter; no mottling; no gravel; soft; few pores; moist; few fine, medium roots; clear smooth boundary.

BC 75-85cm+; brown(7.5YR4/4); clay loam(CL); weak subangular blocky structure; low organic matter; no mottling; no gravel; soft; few pores; moist; no root.

## References

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