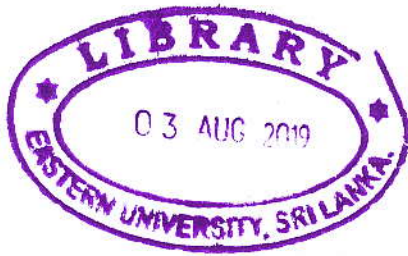


**EFFECTS OF MOISTURE CONTENT ON SOIL WATER
REPELLENCY IN CASUARINA PLANTATION IN
KALUWANCHIKUDY, BATTICALOA**



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ABSTRACT

Soil Water Repellency (SWR) of soils is a common problem in many countries. Casuarina plantation in Kaluwanchikkudy was identified. The region has an intermediate zone with a mean annual precipitation of 900- 1750 mm and a mean annual temperature of 25-30 °C. Soils Water repellency can, among other things, be caused by an organic coating of the particles produced by the growth of microorganisms. The objectives of the present study were to determine (i) to identify the occurrence of water repellent soils by WDPT test (ii) To determine the physical characteristics of water repellent soils and (iii) to study the impact of different moisture contents on soil water repellency. The study area was selected by using WDPT test. Soil texture of the study area was analyzed by hydrometer method. The SWR (soil water repellency) was determined by water drop penetration time (WDPT) method. The SWR test (WDPT) was performed on a field soils and dry soil samples. SWR was analyzed with different soil moisture content. Different moisture content conditions were maintained by using oven. pH and EC were analyzed by using the portable pH meter. Soil organic matter was determined by Walkley and Black titration method. The soil type was tested. Organic matter content of the soils was tested. It's sandy soil (sand, clay and silt- 94.84%, 5.041%, 0.122%). The results reveals that the Soil Organic Matter (SOM) decreases as in the range of 1.12-0.019 (%) from surface to depth of 8-10cm. According to the WDPT test on surface soil, 403.47 seconds (s) of surface soil exhibits severely water repellent while 323.64s exhibits strongly water repellent. The soil changes from strong water repellent (0-2cm layer) to wettable (from 8-10cm to the depth of 25cm) conditions when depth of soil increases. It is observed that there is no relationship between SWR, pH, SWR and EC.

This soil develops repellent properties when drying and the SWR increases as soil moisture contents decrease from air-dried to oven-dried. Content of the soil tested

shows that the organic matter is higher 1.12% in the layer of 0-2cm while lower 0.019% in the layer of 8-10cm. It is observed that 0-2cm soil layer has strong water repellency. The reason could be the higher OM and lower MC. The MC decreases when the drying temperature increases. According to the WDPT test, the SWR increases in all soil layers when the MC decreases. The results reveals that the highest SWR (WDPT is 403.47s) is observed in oven dried soils.

Key words: - Soil water repellency, soil moisture content, soil organic matter, WDPT, bulk density, temperature

TABLE OF CONTENTS

ABSTRACT	i
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
ABBREVIATIONS	x
CHAPTER 01	
INTRODUCTION	
1.1 Background	1
1.2 Objectives	3
CHAPTER 02	
LITERATURE REVIEW	
2.1 Occurrence of soil water repellency	4
2.2 Soil texture and soil water repellency	6
2.3 Characterization of soil water repellency	6
2.4 Causes of soil water repellency	8
2.4.1 Organic matter coating	9
2.5 Soil water repellency and moisture infiltration	10
2.5.1 Infiltration and over land flow	11
2.6 Variation of soil water repellency with soil moisture	11
2.7 Variation of soil water repellency with depth of soil profile	12
2.8 Temperature effects on soil water repellency	13
2.9 Laboratory studies	14
2.10 Field studies	15

CHAPTER O3

MATERIALS AND METHODS

3.1 Selection of site	16
3.2 Description of study area	16
3.3 Terrain characterization	17
3.4 Field assessment of soil water repellency (SWR)	17
3.4.1 WDPT Test	17
3.5 Soil sampling	18
3.6 Laboratory Assessment of soil water repellency (SWR)	
3.6.1 WDPT and MED test	18
3.6.2 Soil moisture content	19
3.6.3 Bulk density	19
3.6.4 Particle density	20
3.6.5 Soil texture	20
3.6.6 Soil PH	21
3.6.7 Electrical conductivity of the soil	22
3.6.8 Organic carbon	22
3.7 Data analysis	23

CHAPTER O4

RESULTS AND DISCUSSION

4.1 Site description	24
4.2 Soil type	24
4.3 Occurrence of soil water repellency	24
4.4 Surface soil water repellency classification	25
4.5 Soil water repellency at different conditions	26
4.6 Soil water repellency changes with bulk densities and organic matter	27
4.7 Soil water repellency with pH, EC and SOC	29

4.8 Soil water repellency at different moisture content (dry basis)	30
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CHAPTER 05

CONCLUSION	33
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SUGGESTIONS AND RECOMMENDATION	34
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REFERENCES	36
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