

**A POPULATION STUDY OF *NYPA FRUTICANS*
(ARECACEAE) ON CAREY ISLAND, MALAYSIA**

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ABSTRACT

Nypa fruticans (Arecaceae) is distributed in mangrove forests of South Asia especially in islands and the coastal area around Malaysia. It is one of the most versatile palms in terms of usage. A population study of *N. fruticans* at two sites using 3 plots was conducted in Carey Island, Malaysia. Aspects of demographic study of *N. fruticans* such as population structure, life stages of individuals, spatial distribution, reproductive phenology, growth rate, survivorship and environmental parameters such as water and soil quality were investigated in this study. Using the growth information, estimation of age would be possible. Four life developmental stages: Seedlings, juvenile, adult and mature are considered to assess growth of the individuals. Size structures of the species show high number of adults and mature trees compared to seedlings. No mortality is observed for trees during the study period. Regular and random distributions were observed for seedlings, juveniles and mature trees. Adults showed both regular and clumped dispersions because of the vegetative reproduction and suckering behavior. Seedlings are detected only in one location with significant difference in leaf production between plots. Rate of leaf production in juveniles is measured at 1 leaf per year. A significant difference in annual average of leaf production for adults (0.8-1.1 leaves per year) and mature trees (0.9-1 leaves per year) between two locations is observed. The total mean age of mature trees is approximately 31.4 - 34.8 years. Mean growth rates of spear leaf height increased from juvenile (55.5 cm per month) to mature trees with maximum spear elongation of 91cm per month; indicating that this species increases in height especially at adult and mature stage. The whole flowering cycle lasted between 8.2 to 9.6 months and 61 (53%) of 115 reproductive trees produced new inflorescence at a rate of one inflorescence per year which gives 60-120 fruits per plant. The soil texture at

the study sites was silty – clay and average temperature of water in Carey Island is 27.3 ± 0.8 and pH is 6.4 ± 0.3 . Significant correlations were observed between salinity and leaf production in juveniles and mature trees. Similarly, correlations were found between leaf production and heavy metals and nutrients at stages seedling and juvenile.

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Dedication

This thesis is dedicated to my parents for their love and support throughout my life.

TABLE OF CONTENTS

	Page
ABSTRACT	ii
ACKNOWLEDGEMENT	iv
DEDICATION	v
TABLE OF CONTENTS	vi
LIST OF TABLES	x
LIST OF FIGURES	xiii
LIST OF SYMBOLS AND ABBREVIATIONS	xv
LIST OF APPENDIXES	xvi
CHAPTER 1: INTRODUCTION	
1.1 General Introduction	1
1.2 Study site	3
1.3 Objectives	4
CHAPTER 2: LITERATURE REVIEW	
2.1 Ecology and distribution	6
2.2 Demography	9
2.3 Reproductive phenology	12
2.4 Taxonomy and morphology	14

CHAPTER 3: MATERIAL AND METHOD

3.1 Population structure and dynamics	17
3.1.1 Population density and spatial distribution	17
3.1.2 Recruits and death	19
3.2 Growth	19
3.3 Age structure	21
3.4 Reproductive phenology	22
3.4.1 Flowering and fruiting	22
3.4.2 Seed germination	23
3.5. Soil and water analysis	24
3.5.1 Soil	24
3.5.1.1 Sampling and drying	24
3.5.1.2 Particle size	25
3.5.1.3 soil pH and temperature	26
3.5.2 Water	26

CHAPTER 4: RESULTS

4.1 Population structure and dynamics	27
4.1.1 Population density and spatial distribution	27
4.1.2 Population changes	32
4.2 Growth	37
4.2.1 Leaf production and spear elongation	37
4.2.1.1 Seedling stage	37

4.2.1.2 Juvenile stage	39
4.2.1.3 Adult stage	43
4.2.1.4 Mature stage	48
4.2.2 Leaf life span	52
4.3 Age structure	53
4.3.1 Seedlings	53
4.3.2 Juveniles	55
4.3.3 Adults	57
4.3.4 Mature trees	59
4.4 Reproductive phenology	62
4.4.1 Inflorescence scoring	63
4.4.2 Inflorescence development	64
4.4.3 Insect visitors	69
4.4.4 Seed germination	70
4.5 Soil and water analysis	71
4.5.1 Soil	71
4.5.2 Water	73
4.5.2.1 Physical parameters	73
4.5.2.2 Heavy metals	76
4.5.2.3 Anions	81

CHAPTER 5: DISCUSSION

5.1 Population structure and dynamics	84
5.1.1 Population density and spatial distribution	84

5.1.2 Population changes	88
5.2 Growth	91
5.2.1 Leaf production and spear elongation	91
5.2.2 Leaf life span	95
5.3 Age structure	96
5.4 Reproductive phenology	98
5.4.1 Inflorescence development and scoring	98
5.4.2 Insect visitors	99
5.4.3 Seed germination	100
5.5 Soil and water analysis	102
5.5.1 Soil	102
5.5.2 Water	104
5.5.2.1 Physical parameters	104
5.5.2.2 Heavy metals, major metals and trace metals	108
5.5.2.3 Anions	110
CHAPTER 6: CONCLUSION	
6.1 Conclusion	113
6.2 Suggestion for future research	116
REFERENCES	191

LIST OF TABLES

Table	Title	Page
Table 4.1	The population number of individuals and the values of coefficient of dispersion for <i>Nypa fruticans</i> in six study plots at both sites.	28
Table 4.2	The percentage of <i>Nypa fruticans</i> in each stage in each plot at both sites.	32
Table 4.3	The ratio of seedling to juvenile, adults and Mature trees, and juvenile to adults, mature trees, and adult to mature trees at first census.	33
Table 4.4	The ratio of seedling to juvenile, adults, mature trees and the ratio of juvenile to adults and mature trees, and the ratio of adult to mature trees at the end of the study	33
Table 4.5	The number of new recruits and annual recruits (%) of <i>Nypa fruticans</i> at both sites.	34
Table 4.6	The mean of some variables of seedlings of <i>Nypa fruticans</i> at site 2.	38
Table 4.7	The mean of some variables of juveniles of <i>Nypa fruticans</i> at site 1.	41
Table 4.8	The mean of some variables of juveniles of <i>Nypa fruticans</i> at site 2.	41
Table 4.9	The total mean of some variables of juveniles of <i>Nypa fruticans</i> at both sites.	42
Table 4.10	The mean of some variables of adults of <i>Nypa fruticans</i> at site 1.	46
Table 4.11	The mean of some variables of adults of <i>Nypa fruticans</i> at site 2.	46
Table 4.12	The total mean of some variables of adults of <i>Nypa fruticans</i> at both sites.	47
Table 4.13	The mean of some variables of matures of <i>Nypa fruticans</i> at site 1.	50

Table 4.14	The mean of some variables of matures of <i>Nypa fruticans</i> at site 2.	50
Table 4.15	The total mean of some variables of adults of <i>Nypa fruticans</i> at both sites.	51
Table 4.16	The mean of leaf life span of <i>Nypa fruticans</i> in four stages at site 1.	52
Table 4.17	The mean of leaf life span of <i>Nypa fruticans</i> in four stages at site 2	52
Table 4.18	The mean of leaf life span of <i>Nypa fruticans</i> in four stages at both sites.	53
Table 4.19	The mean of calculated age (years) of <i>Nypa fruticans</i> in four stages at site 1	61
Table 4.20	The mean of calculated age (years) of <i>Nypa fruticans</i> in four stages at site 2.	61
Table 4.21	The mean of calculated age (years) of <i>Nypa fruticans</i> in four stages at both sites.	62
Table 4.22	Mean values for male inflorescence in <i>Nypa fruticans</i> (Means \pm sd, N=6).	63
Table 4.23	Mean values for female inflorescence in <i>Nypa fruticans</i> (Means \pm sd, N=6)	64
Table 4.24	pH, temperature of soil samples in Carey Island during 16 months at site 1.	72
Table 4.25	pH, Temperature of soil samples in Carey Island during 16 months at site 2.	72
Table 4.26	pH, Temperature soil samples in Carey Island during 16 months at both sites.	73
Table 4.27	The mean of variables of water samples (N=21 in each plot) at site 1 during 14 months in Carey Island.	74
Table 4.28	The mean of variables of water samples (N=18 in each plot) at site 2 during 14 months in Carey Island	74

Table 4.29	The total of mean variables water samples at both sites during 14 months in Carey Island.	75
Table 4.30	The mean concentration of heavy metals of water samples at site 1 during 15 months in Carey Island.	76
Table 4.31	The mean concentration of heavy metals of water samples at site 2 during 15 months in Carey Island.	77
Table 4.32	The mean concentration of heavy metals of water samples at both sites during 15 months in Carey Island.	77
Table 4.33	The mean concentration of major and trace metals of water samples at site 1 during 15 months in Carey Island.	78
Table 4.34	The mean concentration of major and trace metals of water samples at site 2 during 15 months in Carey Island.	79
Table 4.35	The total mean concentration of major metals from water samples at both sites during 15 months on Carey Island.	79
Table 4.36	The mean concentration of anions (ppm) of water samples at site 1 during 15 months in Carey Island.	81
Table 4.37	The mean concentration of anions (ppm) of water samples at site 2 during 15 months in Carey Island.	81
Table 4.38	The total means concentration of anions (ppm) of water Samples at both sites during 15 months in Carey Island.	82

LIST OF FIGURES

Figure	Title	Page
Figure1.1	<i>Nypa fruticans</i> in Carey Island	2
Figure1.2	Carey Island (Pualu Carey) in Malaysia	3
Figure 1.3	Carey Island (Pualu Carey) in Kelang Isles and location of site1 and site2.	4
Figure 2.1	The inflorescence of <i>Nypa fruticans</i>	14
Figure2.2	The branching rhizomes in <i>Nypa fruticans</i>	15
Figure 4.1	Spatial distribution of <i>Nypa fruticans</i> at site 1, plot 1	28
Figure 4.2	Spatial distribution of <i>Nypa fruticans</i> at site 1, plot 2	29
Figure 4.3	Spatial distribution of <i>Nypa fruticans</i> at site 1, plot 3	29
Figure 4.4	Spatial distribution of <i>Nypa fruticans</i> at site 2, plot 1	30
Figure 4.5	Spatial distribution of <i>Nypa fruticans</i> at site 2, plot 2	30
Figure 4.6	Spatial distributions of <i>Nypa fruticans</i> at site 2, plot 3	31
Figure 4.7	The mean number of new recruits during 16 months by bi- monthly observation at site 1.	35
Figure 4.8	The mean number of new recruits during 16 months by bi- monthly observation at site 2.	36
Figure 4.9	Leaf production and spear elongation in 1 seedling in Carey Island during 16 months.	37
Figure 4.10	Leaf production and spear elongation in 2 juvenile trees in Carey Islands during 16 months and in 6 juveniles during 17 months at both sites.	40
Figure 4.11	Leaf production and spear elongation in 9 adult trees in Carey Islands during 17 months and in 5 trees during 16 months at both sites.	45
Figure 4.12	Leaf production and spear elongation in 2 mature individuals in Carey Islands during 17 months and in 6 matures during 16 months.	49

Figure 4.13	The age structure of all seedlings of <i>Nypa fruticans</i> . N=8.	54
Figure 4.14	The regression between age and the total number of leaves (tlf) in seedlings of <i>Nypa fruticans</i> (N=8).	55
Figure 4.15	The age structure of juveniles of <i>Nypa fruticans</i> .	56
Figure 4.16	The regression between age and the total number of leaves (tlf) in juveniles of <i>Nypa fruticans</i> . (N= 50).	56
Figure 4.17	The age structure of adults of <i>Nypa fruticans</i> (N=248).	58
Figure 4.18	The regression between age and the total number of leaves (tlf) in adults of <i>Nypa fruticans</i> (N= 248).	58
Figure 4.19	The age structure of matures of <i>Nypa fruticans</i> (N=58).	60
Figure 4.20	The regression between age and the total number of leaves (tlf) in Matures of <i>Nypa fruticans</i> . (N= 58)	60
Figure 4.21	The appearance of male and female flower <i>Nypa fruticans</i> in stage 2 to stage 7.	68
Figure 4.22	Seed germination of <i>Nypa fruticans</i> in glasshouse	71

LIST OF SYMBOLS AND ABBREVIATIONS

<	less than
\geq	more than and equal
n	number
SD	standard deviation
Ind	individual
m	meter
llf	living leaf
dlf	dead leaf
tlf	total number of leaf
Lde	Plastochrone
Nslf	new spear leaf
Lls	leaf life span
Ns	no significant differences
*	Significant differences
cm	centimeter
Mc	moisture content
TDS	total dissolved solid
DO	dissolved oxygen
EC	electroconductivity
Infl	Inflorescence
a	significant difference between plot 1 and 2
b	significant difference between plot 1 and 3
c	significant difference between plot 2 and 3

LIST OF APPENDIXES

Appendix 1	118
Appendix 1.1	118
Appendix 1.2	124
Appendix 2	129
Appendix 3	131
Appendix 3.1	131
Appendix 3.2	132
Appendix 4	134
Appendix 4.1	134
Appendix 4.2	136
Appendix 5	146
Appendix 6	151
Appendix 6.1	151
Appendix 6.2	152
Appendix 7	153
Appendix 7.1	153
Appendix 7.2	157
Appendix 7.3	159
Appendix 7.4	163

Appendix 8	165
Appendix 8.1	165
Appendix 8.1.1	165
Appendix 8.1.2	171
Appendix 8.2	178
Appendix 8.3	182
Appendix 8.3.1	182
Appendix 8.3.2	186