



# PROCEEDINGS

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**SIGNIFICANCE OF CLIMATE CHANGE ON BIODIVERSITY  
IN SUSTAINING THE GLOBE**

Lombok, West Nusa Tenggara, Indonesia, 6 - 8 November 2012

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**Sitti Latifah, Ph.D (University of Mataram)**  
**Baiq Dewi Krisnayanti, Ph.D (University of Mataram)**



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## **PREFACE**

Continuing The 1<sup>st</sup> International Conference on Biodiversity in 2011 that was held in Solo, The Society For Indonesian Biodiversity proudly held The 2<sup>nd</sup> International Conference on Biodiversity which was focus on issues related to “Significance of Climate Change on Biodiversity in Sustaining The Globe. This conference has attracted significant numbers of participants from scientist, government agencies, NGO, and other experts from 5 different countries (Australia, New Zealand, United Sates of America, Malaysia, and Indonesia). This event was expected to promote innovations in the real research on biodiversity to tackle biodiversity loss that rapidly occured in our life.

The proceeding is the continuation of the 1<sup>st</sup> proceeding issued by the Society for Indonesian Biodiversity. The proceeding contain all oral and poster presented on the 2<sup>nd</sup> ICB 2012 in Lombok, Indonesia. Papers presented in this proceeding comprised wide ranges of issues regarding climate change impacts of agricultural and forestry biodiversity, fresh water, coastal and marine diversity, as well as economic and community biodiversity.

On behalf of The Society for Indonesian Biodiversity, we would like to thank to all authors, paper reviewers, editorial team, organizing committee, local government, and sponsors for their contribution and involment in this conference.

Mataram, July 2013

Sutarno  
Chairman of the Society for Indonesian Biodiversity

## CONTENTS

Preface .....	iii
Content .....	ivi

### KEYNOTE SPEAKER :

1. Climate Change Science and Impacts (Miko U.F. Kirschbaum)	1
2. Biodiversity of Dacinae Fruit Flies (Insecta: Diptera: Tephritidae) (Hoi Sen Yong, I. Wayan Suana, Phaik Eem Lim, Ji Tan and Praphathip Eamsobhana)	15
3. Maintaining Biological Diversity By Reducing CO <sub>2</sub> Emission (Sutarno)	21
4. Indonesian Biodiversity Under Climate Change Threaten (Bambang Hero Saharjo)	24

### ORAL :

5. <i>Pangium edule</i> Reinw as Traditional Foodstuff For Organic Food Preservative (Anwar Kasim and Wahyudi David)	33
6. <i>Meristogenys</i> Yang, 1991 (Anura: Ranidae) From Kalimantan: Conservation, Opportunities and Threats (Najmi Firdaus)	38
7. Monitoring of Phytoplankton to Asses Quality of Water in Cileduk Lake, Ciputat, Indonesia (Lily Surayya Eka Putri)	44
8. Breaking Seed Physical Dormancy of <i>Gleditsia assamica</i> (Fabaceae): Promising Introduced Tree For Reforestation (I Nyoman Peneng and Arief Priyadi)	50
9. Study of Containerized <i>Gleditsia assamica</i> Seedlings Growth By Using Response-Surface Methodology (Arief Priyadi and I Nyoman Peneng)	54
10. Diversity and Potency of Dung Beetles as Bioindicators of Environmental Changes of Tropical Land-Use in Sulawesi, Indonesia (Shahabuddin, Uswah Hasanah, Elijonahdi)	58
11. Diversity of Birds at Batu Hijau, Sumbawa: a Summary of 1996-2011 Surveys (Muhamad Salamuddin Yusuf dan Pupung Firman Nurwatha)	65

12.	Morphological, Physiological and Genetic Diversity of Marine Agarolytic Bacteria Isolated From Central Lombok Coastal (Faturrahman, Anja Meryandini, and Iman Rusmana)	79
13.	Endemic Plants of MT. Rinjani: an Outlook to the Conservation Strategy (W. Wardani, A. Hidayat, E.F. Tihuraa, A. Kartonegoro, L.D. Sulistyaningsih, E. S. Kuncari, E.B. Walujo)	87
14.	Crop Diversity on Dryland as an Adaptation Strategy to Climate Change (I Komang Damar Jaya, Rosmilawati, I Wayan Sudika, L. Juriadi Suriawan)	93
15.	The Diversity of Insect Pests on a Mango Plantation at Denpasar City, Bali (Ni Luh Watiniasih, Ngurah Evan Malabi and Ni Made Suartini)	98
16.	Genetic Diversity of Teak ( <i>Tectona grandis</i> L.f.) Populations in West Bali Based on Microsatellite Data (Made Pharmawati, I Ketut Junitha, Ni Luh Watiniasih)	102
17.	Rapid Assessment on Macro Invertebrates at Nyangnyang Beach Jimbaran Bali (Deny Suhernawan Yusup)	107
18.	Spatial Distribution of Vesicular Arbuscular Mycorrhizal (Vam) Fungi at Tasmanian Heath-Lands Australia (Meitini W. Proborini)	110
19.	Diversity of Freshwater Fishes: Aquaculture For Community Welfare Atlake Sentani, Papua (Ervina Indrayani, Suwarno Hadisusanto, Rustadi, Kamiso, H.N.)	115
20.	Genetic Improvement of <i>Vigna</i> Germplasm Through Interspecific Hybridization (Lestari Ujianto)	120
21.	Prospect of Tambrau as Conservation Regency in West Papua (A Preliminary Analysis) (Gabriel Asem, Petrus Kahisiuw, Sepus Fatem, Yubelince Runtuboi, Jonni Marwa, And Devi Manuhua)	126
22.	Diversity of Plants Used For <i>Lo'i Praja</i> , A Traditional Medicine For Mbojo Ethnic In West Nusa Tenggara (Syaraswati, I Komang Damar Jaya, I Made Sudarma)	134
23.	Bird Community of Coastal Areas (Ela'-Ela' Beach) West Sekotong, West Lombok, Indonesia (Immanuel Sanka, Muhammad Reza Ardhi, and Herawan Putra)	141
24.	Growth of Peanut Lines Generated From Gamma Ray Irradiation Against Polyethylene Glycol Solution Stress (Syarifinnur, Lestari Ujianto and A. Farid Hemon)	146
25.	The Diversity of Genus <i>Capparis</i> Found in Mount Nglanggeran Gunung Kidul Yogyakarta and Surrounding Formation (Widodo)	151
26.	Birds at Three Forest Reserves of Pangkor Island, Perak (Rahmah Ilias and Hamdon Tak)	157
27.	Variation in Reproductive Structures of Some Red Algae From West Java (Sukiman, Chikmawati T, Aryanti NS)	161

28.	Plant Regeneration Via Somatic Embryogenesis From Protoplast of <i>Clausena harmandiana</i> (Engl.) 'Swing. & M. Kell (Hasan Basri Jumin and Faturrahman)	168
29.	Preliminary Study of Her-2/Neureceptor Analysis in Indonesian Breast Cancer Patients: Isolation of Her-2/Neureceptorgene (Desriani, Ramadhan, Wirisma Arief Harahap, Wiwit Amrinola, Neneng Hasanah)	175
30.	Production and Nutrient Content of Calopo With Inorganic Fertilizer From Different Sources (Dwi Retno Lukiwati, F.E. Syahputra and F. Kusmiyati)	178
31.	Geographical Distribution of <i>Salmonella typhi</i> Isolates From Southwest Sumba District, East Nusa Tenggara Based on Biochemical Diversity and Its Public Health Implications (Charis Amarantini, Langkah Sembiring, Haripurnomo Kushadiwijaya, Widya Asmara)	181
32.	The Recovery of Plant Species Diversity in 14 Year-Old Forest in Rehabilitated Mined Land in Central Bengkulu (Wiryono and James Byekher Douni)	188
33.	Conserving Indigenous Lombok Bees Through Community Empowerment in Bee Queen Reproduction (Baiq Yulfia Elsadewi Yanuartati, Erwan)	196
34.	Portunid Crabs (Decapoda: Brachyura: Portunidae) From Coastal Area of Gunung Kidul Regency, Yogyakarta, Indonesia (Herawati, P., Nirwantono, R., Siwi, K. A. Y. K., Sanka, I., Amalia, R., Aulia, R., Ariyanto, I. A., and Aminjoyo, N.)	202
35.	Anomura Crustaceans Community in Coastal Area of Sepanjang, Yogyakarta, Indonesia (Rizqa Amalia, Kresti Ary Yani Kusumo Siwi, Praty Herawati, Imanuel Sanka)	209
36.	Diversity of Decapods (Crustacea) in Coastal Area of Nguyahan Beach, Gunung Kidul, Indonesia (Siwi,K.A.Y.K., Putri,A.R., Herawati,P., Amalia.R., Sanka.I., Aulia.R. Aryanto.I., Aminjoyo.N.)	213
37.	Comparison of Fish Abundance and Trophic Group Analysis, in Gili Genting and Gili Layar Beach, Sekotong Peninsula, West Lombok Regency, Nusa Tenggara Barat, Indonesia (Ernisa Maranatha Nainggolan, Erly Sintya Dewi, Raden Aditya Aryandi, Muhammad Rafieiy, Rindra Aryandari, Khairunnisa Arumsari, Haikal Prima Fadholi, Ali Fikri, Durrotun Nasihah, Ika Septiyani)	220
38.	Molecular Identification of Indonesian Agarwood-Inducing Fungi (Yuda Purwana Roswanjaya, Ahmad Saufi, Ahmad Suhendra, Henti Rosdayanti, and Arief Arianto)	226
39.	Identification of Potential Phytoextraction Plant For Mercury in West Nusa Tenggara Province (Baiq Dewi Krisnayanti, Zainal Arifin, Bustan, Sudirman, Ahmad Yani)	232
40.	The Diversity and Potency of Understories Medicinal Plants in Ranggawulung Urban Forest, Subang (Dina Anggraini, Lily Syrayya Eka Putri, Dasumiati, Ani Mulyani, Angga Restiadi)	236
41.	Population Study of the Crown-of-Thorns Starfish (Cots), <i>Acanthaster planci</i> on the Tidung Island Kepulauan Seribu Jakarta (Hanum Isfaeni)	239

42.	Antioxidant Property of Gigantochloa Bamboo Leaves Extract (Supriyatin, Sri Rahayu)	244
43.	Molecular Characterization of <i>Salmonella</i> Isolated From Raw Cow’s Milk in Yogyakarta Indonesia (Tri Yahya Budiarmo, Charis Amarantini)	247
44.	Physiological Responses of Black-Seeded Soybean Genotypes on Drought Stress Based on Specific Characters (Kisman, Aluh Nikmatullah, M. Sarjan)	254
45.	Economic Performance of Two Rice Types ( <i>A Case Study in East Lombok</i> ) (Rusdi Hidayat N.)	259
46.	Dominant Species of Plant Pathogenic Fungi Attacking Water Hyacinth in Batujai Dam and Their Potency as Biological Control Agents of the Weed (M. Taufik Fauzi, Murdan, and Irwan Muthahanas)	262
47.	Biodiversity of Indonesian Seaweed of <i>Eucheuma/Kappaphycus</i> spp (Aluh Nikmatullah, Mursal Ghazali, Sunarpi)	271
48.	Application of Technology of Mangos Off Season Atvarious Climate Types in Lombok NTB, Indonesia (Muji Rahayu ,Ahmad Suriadi, Baiq Nurul Hidayah <sup>1</sup> , Brian Thistleton, Sohail Qureshi and Ian Baker)	279

**POSTER :**

49.	Irradiation and <i>in Vitro</i> Selection Induced <i>in Vitro</i> Mutagenesis of Sugarcane Improvement (Ragapadmi Purnamaningsih <sup>1</sup> Ika Mariska, Endang Gati, Sri Hutami and Rossa Yunita)	288
50.	Effect of Depth on Yield Carrageenan of <i>Eucheuma cottonii</i> Grown With Vertical Method (Salnida Yuniarti, Paryono, and Dewi Setyowati)	293
51.	Assessment of the Secondary Metabolites From Different Fungal Isolates to Induce the Production of Agar Wood (“ <i>Gaharu</i> ”) on Sustainably Cultivated <i>Gyrinops versteegii</i> of Lombok Island (Mulat Isnaini, Herman Suheri, Aluh Nikmatullah, and Irwan Muthahanas)	296
52.	<b>Agronomical Characters of Four Lombok Island Indigenous Genotypes of Castor Bean (<i>Ricinus communis</i> L.) (Bambang Budi Santoso and Nurrachman)</b>	<b>303</b>
53.	Potency of Red Algae As Sources of Phycocolloid In Coastal Area of West Java (Chikmawati T, Sukiman, Aryanti NS)	306
54.	Exploration on Endangered Herbal Plants in Central Lombok District, Nusa Tenggara Barat Province (Karwati Zawani and Liana Suryaningsih)	311
55.	Growth and Yield of Wheat Genotypes at Lowland Lombok (Dwi Ratna Anugrahwati and Akhmad Zubaidi)	314

# AGRONOMICAL CHARACTERS OF FOUR LOMBOK ISLAND INDIGENOUS GENOTYPES OF CASTOR BEAN (*Ricinus communis* L.)

**Bambang Budi Santoso and Nurrachman**

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## ABSTRACT

The major problem in cultivation and commercialization of castor bean (*Ricinus communis* L.) in West Nusa Tenggara as one of bio-energy crops has been lack of high yielding varieties for seed yield and seed oil content. Therefore, castor bean germplasm exploration has been conducted for further breeding programme. Characterization of the vegetative and reproductive traits within genotypes is useful in evolving high yielding varieties for certain condition of land. The exploration was then followed with screening for growth and yield performances of four selected genotypes, i.e. Beaq Amor, Klikit Kayangan, Gundul Bayan, and Hijau Sembalun. The result indicated that the genotypes showed significant differences in most vegetative and reproductive traits. Those differences in characteristics could be used as information of their genotypes attributes.

Key words: castor, characters, exploration, germplasm, varieties

## INTRODUCTION

In the present year conservation and energy production has significant importance in the wake of the world energy crisis. Oil seed crops are potential renewable sources of fuels and castor bean (*Ricinus communis* L.) is one of that resources.

No report on genetic improvement aspect of this species has been taken up so far in Indonesia, but restricted to few publications at the global level. Systematic provenance trials at different locations have not been carried out intensively. On the castor development, we need trees with good genetic, high potential of yield, and good adaptation to wide range of bad environmental condition.

Screening of existing population in Indonesia for oil yield is needed to select the best producing genotypes. It can be used as source for crop improvement material. Besides, it can also serve for profitable production before systematic crop improvement program can yield good cultivation. This poster article described variation in vegetatives and generatives characteristic and also seed oil content of several selected castor genotypes

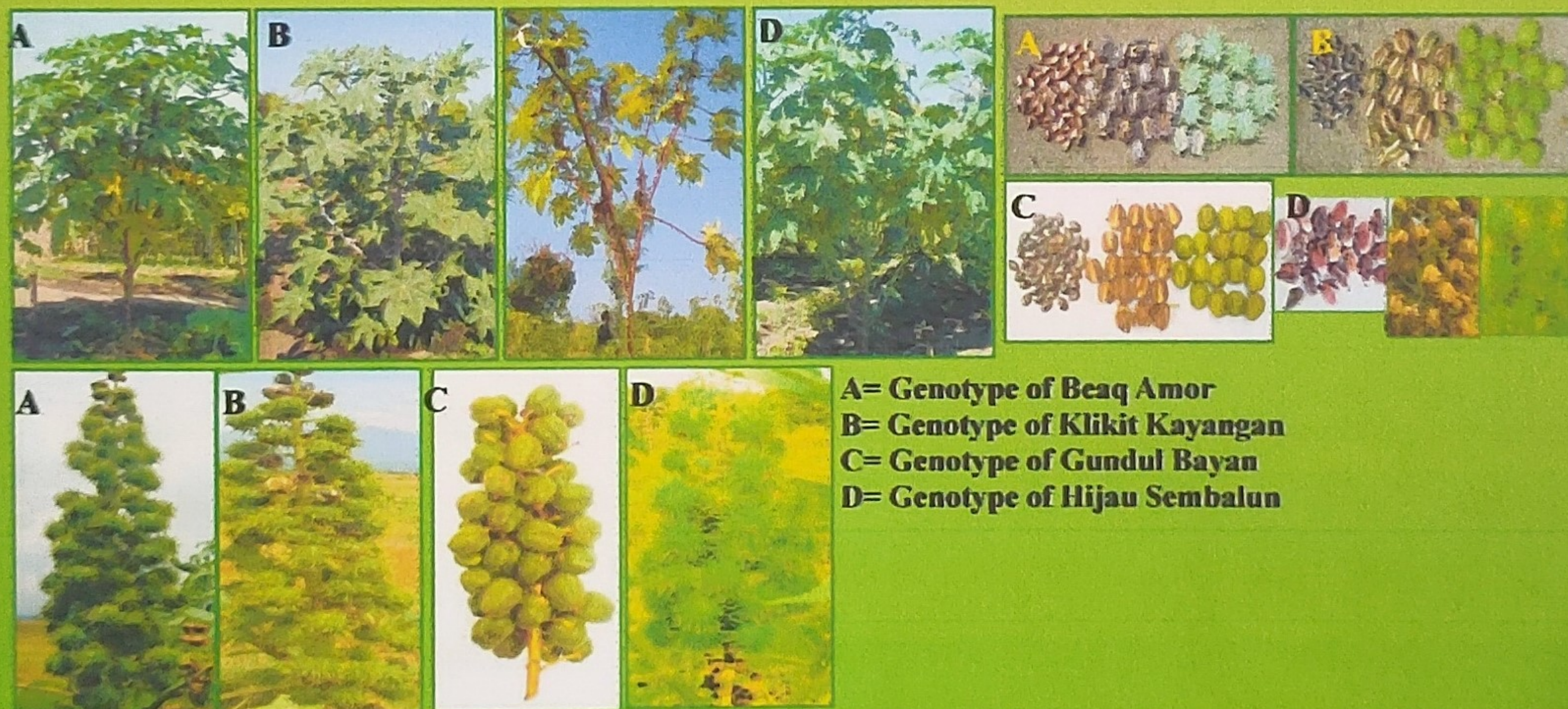
## MATERIALS AND METHODS

Exploration of plant material was done from April until May 2008 in Lombok island, West Nusa Tenggara (NTB), Indonesia where large population of castor grown was found. Seed from each genotype were obtained from tree stand showing good growth and development and representative for each region, and then prepared for study.

Study in cultivation areas was conducted at Amor-Amor Village, Subdistrict Khayangan, North Lombok, West Nusa Tenggara, during 2009-2010. Seeds were planted in the field experimental to test yield potential of each genotype without experiment design and three replications. Each experiment unit contained 24 trees plotted in 2 m x 3 m spacing.

## RESULT

In general, seed sources of castor NTB genotypes vary significantly with respect to vegetatively morphological and reproductive characters. Table 1. below shows characteristics of castor Lombok island indigenous genotypes, and Figure 1 shows their performances. Result at the present study reveled that considerable differences exist in all reproductive and vegetative characteristics among the different genotype of indigenous Lombok Islands castor, Beaq Amor was found as a superior genotype on the basic of seed yield, seed oil content, and others agronomics traits.



Characters	Beaq Amor	Klikit Kayangan	Gundul Bayan	Hijau Sembalun
Origin	North Lombok, NTB	North Lombok, NTB	North Lombok, NTB	East Lombok, NTB
Growth type	Upright	Upright	Upright	Upright
Hight of plant (cm)	125-275	200-360	175-300	130-300
Production period	1-3 years	1-4 years	1-2 years	1-3 year
Day of flowering (days)	40-70	70-90	65-90	55-80
Day of harvest (days)	120-160	155-190	160-180	135-170
Leaf form (lamina)	Peltatus, palmitate, round	Peltatus, palmitate, round	Peltatus, palmitate, round	Peltatus, palmitate, round
Leaf colour	Green	Green	Yellowies to green	Green
Colour of leaf petiole	Green to violet	Green to violet	Green to violet	Green
Lenght of leaf petiole (cm)	20-50	25-50	25-60	25-60
Stem colour	Green to violet	Violet to redish	Violet to redish	Green
Number of primary and scundery branches	2-10	3-7	3-6	3-10
Lenght of spike (cm)	35-90	30-75	40-65	40-90
Number of capsules/spike	60-130	40-110	40-105	50-140
Capsule form	Round with hair	Round with short hair	Round and bold	Round with hair
Maturation processes of capsules	Bertahap	Bertahap	Bertahap	Bertahap
Degree of spikes papow	Easy	Relatively easy	Relatively easy	Easy
Weight of 100 seeds (g)	28-31	22-28	25-35	27-32
Seeds yield potential/plant/ year (g)	1.008-1.280	650-1.100	760-1.300	1.010-1.270
Oil content of seed kernel (% w/w)	56-65	50-67	40-50	53-60
Condition of the experiment site during description	Semiarid type of climate with mean annual rainfall 600-900 mm			



## AGRONOMICAL CHARACTERS OF FOUR LOMBOK ISLAND INDIGENOUS GENOTYPES OF CASTOR BEAN (*RICINUS COMMUNIS* L.)

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Screening of existing population in Indonesia for oil yield is needed to select the best producing genotypes. It can be used as source for crop improvement material. Besides, it can also serve for profitable production before systematic crop improvement program can yield

Article presented as poster at The 2<sup>nd</sup> International Conference on Biodiversity, Matam, Lombok, West Nusa Tenggara, Indonesia, 6-8 November 2012. good cultivation. This poster article described variation in vegetative and generative characters and also seed oil content of several selected

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### MATERIALS AND METHODS

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### RESULT AND DISCUSSION

In general, seed sources of castor NTB genotypes vary significantly with respect to vegetatively morphological and reproductive characters. Table 1. below shows characteristics of castor Lombok island indigenous genotypes, and Figure 1 shows their performances. Those

of the morphological vegetatives and generatives difference might be due to genetic difference. Therefore, with adequate genetic variability exists in Lombok indigenious castor germplasm could be exploited in the breeding programmes. Sujatha *et al.* (2008) state that the development of indigenious genotypes has given new impetus to hybrid castor development

Based on this research, it is necessary to inform the important characters which can be

used to distinguish the Lombok indigenious castor genotypes. Result at the present study reveled that considerable differences exist in all reproductive and vegetative characteristics among the different genotype of indigenious Lombok Islands castor. Beaq Amor was found as a superior genotype on the basic of seed yield, seed oil content, and others agronomics traits.

Table 1. Description of Castor (*Ricinus communis* L.) Lombok Island Indigenious Genotypes

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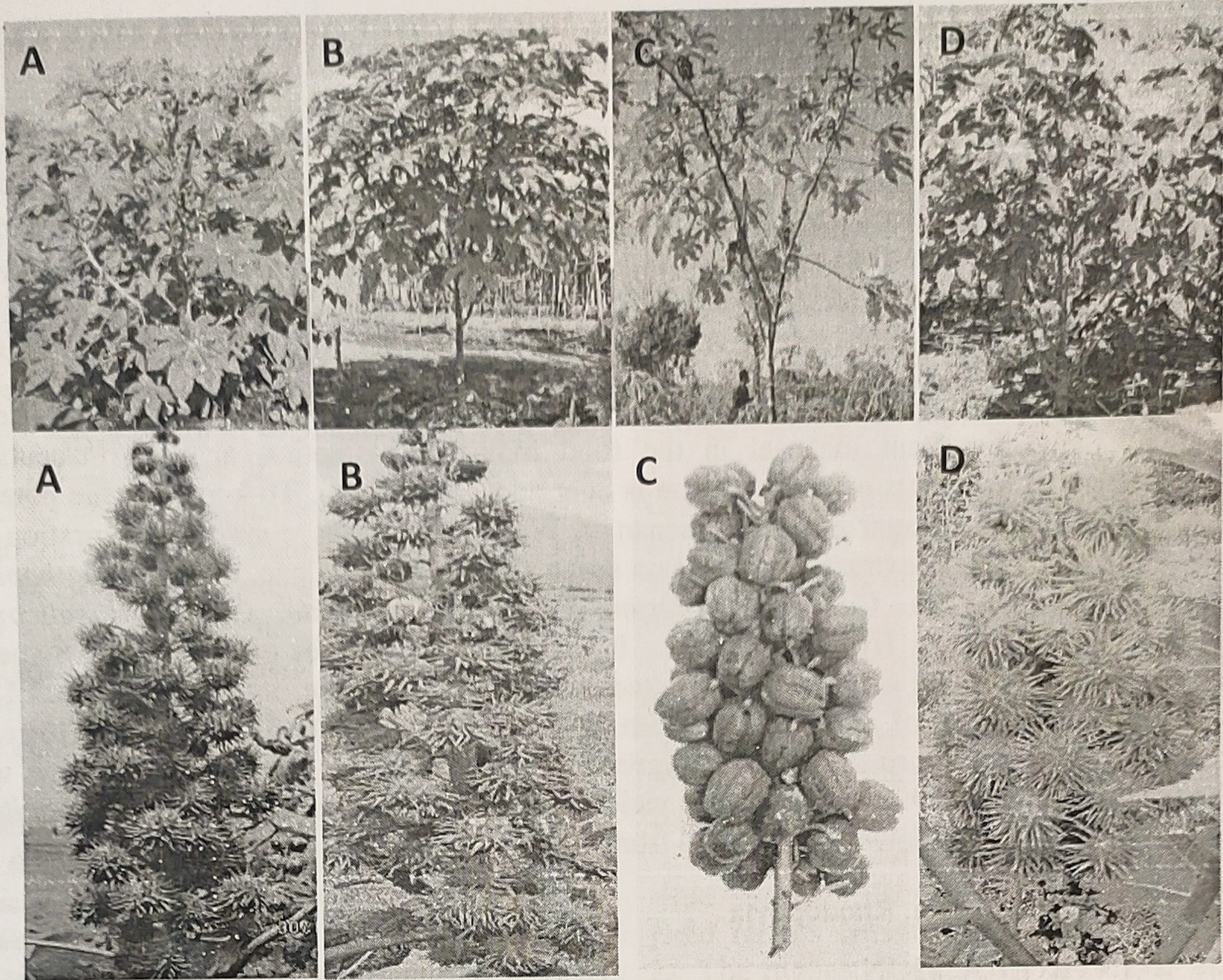


Figure 1. Performances of four castor (*Ricinus communis* L.) Lombok Island indigenous genotypes

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