



GENETIC DIVERSITY

CHALLENGE TO CONSERVATION,
HEDGE ORCHARD ESTABLISHMENT AND PLANTATION
OF RAMIN (*Gonystylus bancanus* (Miq.) Kurz)

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PRESENTATION OUTLINE

1. Introduction
2. The Activity
3. Results and Discussion
4. Impacts
5. Conclusion and Recommendation
6. Lessons Learnt

INTRODUCTION

- Importance and condition of Ramin

1. One of important species in PSF
2. The species are mostly under serious threat by various disturbance
3. Listed in Appendix of CITES since 2001

- Importance of genetic diversity study

1. Fundamental to the overall survival mechanism
2. Development conservation strategy
3. Future plantation both from generative and vegetatively mass propagation

● Available information of genetic diversity for Ramin

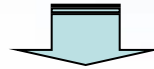
Very limited information of genetic diversity for ramin, especially for Indonesia populations

● Aspects to be addressed in this presentation

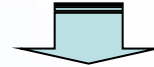
1. Analyses of ramin genetic variation
2. Hedge orchard establishment
3. Mass propagation and plantation of ramin (*G. bancanus*)

THE ACTIVITY

Genetic variation study



Genetic variation & genetic distance of ramin populations



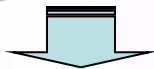
Conservation strategy (ex-situ & in-situ conservation)



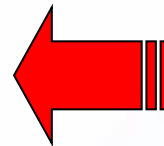
Hedge orchard



Plantation/Hedge orchard



Plantation



Analysis of genetic variation

RESULTS AND DISCUSSION

Genetic variation

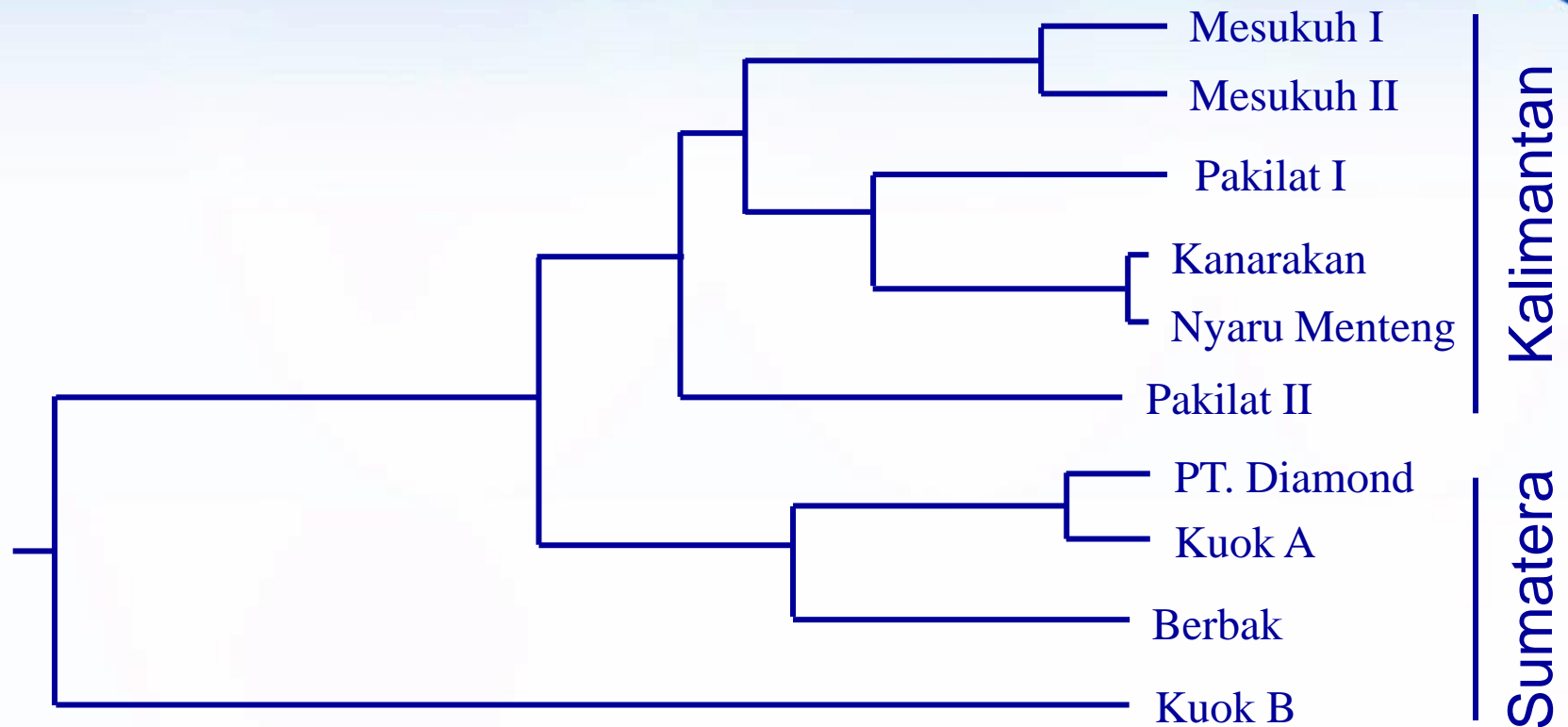


Location of *G. bancanus* sampel populations

- Mean genetic diversity of 10 populations of Ramin was 0.329. Genetic variation of populations of ramin was range between 0.268 (Riau) and 0.368 (West Kalimantan)

- Genetic relationship

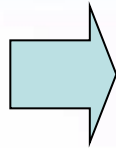
Source	df	SS	MS	Est. Var.	%
Among Regions	3	165,015	55,005	1,447	8%
Among Pops	6	118,033	19,672	0,269	1%
Within Pops	86	1501,222	17,456	17,456	91%
Total	95	1784,271		19,172	100%



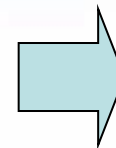
Dendrogram of ten populations of *G. bancanus* based on cluster analysis

Development of Stem Cutting

Media preparation



Shoots



Shoots collection



Rooting check



Planting shoot in polybag



Hedge Orchard Establishment

Two methods:

1. Hedge orchard

- Wildlings collection
- Establishment of hedge orchard



2. Plantation/Hedge orchard

- Wildlings/seeds collection
- Seedling production
- Wildlings maintaining
- Planting in forest
- Used as shoots source



Plantation

Two locations:

1. Ogan Komering Ilir, South Sumatera

- Ex-burnt forest
- Water surface management



2. Tumbangnusa, Central Kalimantan

- Secondary forest
- Line planting system



IMPACTS

- ☺ These activities provide information on the status of genetic variation, the availability of planting materials, the methods of propagation and longterm strategy to restore and conserve ramin population. These aspects contribute to the effort to conserve and sustainable management of CITES-listed ramin species.
- ☺ The information on genetic variation, methods of vegetative stem cutting, Hedge Orchard establishment have been providing impact to sustainable management on ramin.
- ☺ Several related institutions in rehabilitation-plantation of ramin have expressed their commitment to participate in the program once the capacity to produce ramin planting materials have been scaled up. The show of interests have shown by provincial forest Service in Central kalimantan, South Sumatra and other concession companies operating in PSF

CONCLUSION AND RECOMMENDATION

Conclusion

- ☺ Genetic variation of remaining Ramin populations is still high. The populations were clustered into 2 groups according to the island.
- ☺ Rehabilitation-plantation is critical important to restore ramin population. At this time, the only alternative to produce ramin planting materials is through vegetative stem cuttings (rooted cuttings). In order to produce vegetative cuttings, large number of stockplants in Hedge Orchards are required to be established

Recommendation

- ☺ Conservation program and plantation activity should be based of genetic diversity information.
- ☺ In order to improve the production and HO management, more R&D on the techniques and methods are required. Analyses on the genetic variation of HO population and vegetatively propagated population is necessary to ensure the conservation of the species.
- ☺ In relation to the rehabilitation-plantation, it is recommended that the support to the mass propagation of planting materials and field plantation of ramin are consistently available.

LESSONS LEARNT

- ☺ Conservation strategy and activities should be based on genetic variation information in order to maintain the genetic diversity of the species.
- ☺ Activities such as plantation for hedge orchard (shoot source) and vegetatively propagated population can be challenging activities for species those very difficult to get seed/seedling/wildlings



THANK YOU
TERIMA KASIH
MATUR SUKSEMA

