

ABSTRAK

BIOSISTEMATIKA KULTIVAR BELIMBING MANIS (*Averrhoa carambola* L.) BERDASARKAN MORFOLOGI DAN DNA BARCODING DI DESA TARUB KABUPATEN GROBOGAN JAWA TENGAH

Syifara Chika
NIM. 24020123410005

Buah belimbing manis (*Averrhoa carambola* L.) mempunyai nilai ekonomis yang tinggi, akan tetapi penelitian tentang biosistematika kultivarnya di Indonesia masih terbatas. Kemiripan karakteristik kultivar belimbing secara umum menyulitkan proses identifikasi kultivar secara akurat. Hal tersebut mengakibatkan kesalahan identifikasi dan tumpang tindih nama di masyarakat. Kultivar Karangsari dan Bangkok Merah sering dianggap sama, meskipun mempunyai perbedaan habitus dan buah. Penelitian ini bertujuan untuk mengidentifikasi dan mengkaji hubungan kekerabatan antar kultivar belimbing menggunakan pendekatan morfologi dan DNA Barcoding marka *Internal Transcribed Spacer*. Sampel penelitian adalah lima kultivar belimbing manis yang terdapat di perkebunan belimbing di Desa Tarub Kabupaten Grobogan, Jawa Tengah. Analisis cluster menggunakan metode UPGMA dan indeks kemiripan dihitung berdasarkan *Simple Matching Coefficient*. Rekonstruksi pohon filogenetik dilakukan menggunakan aplikasi MEGA 11 dengan metode *Maximum Likelihood* dan *Neighbor-Joining*. Terdapat lima kultivar *A. carambola* yaitu kultivar Dewa, Dewi, Madu, Bangkok Merah, dan Karangsari. Kultivar Bangkok Merah dan Karangsari memiliki hubungan kekerabatan yang sangat dekat, demikian juga kultivar Dewa dan Dewi. Sementara itu, kultivar Madu terpisah dari kultivar lainnya karena perbedaan morfologi dan variasi genetik yang signifikan. Analisis haplotype menunjukkan nilai keragaman haplotipe yang tinggi, dengan nilai *haplotype diversity* (hd) sebesar 0,98, mengindikasikan keberagaman genetik yang cukup luas dalam populasi belimbing yang diteliti.

Kata Kunci: *A. carambola*, analisis kekerabatan, biosistematika, DNA barcoding

Disetujui

Pembimbing I



Dr. Lilih Khotimperwati, S.Si, M.Si
NIP. 196903301994032001

Pembimbing II



Ni Kadek Dita Cahyani, S.Si, M.Si, Ph.D.
NIP. H.7.198012062022022001

ABSTRACT

BIOSYSTEMATICS OF SWEET STARFRUIT CULTIVARS (*Averrhoa carambola* L.) BASED ON MORPHOLOGY AND DNA BARCODING IN TARUB VILLAGE GROBOGAN REGENCY CENTRAL JAVA

Syifara Chika
NIM. 24020123410005

The sweet starfruit (*Averrhoa carambola* L.) has high economic value, but research on the biosystematics of its cultivars in Indonesia is still limited. The general similarity in characteristics among starfruit cultivars complicates the accurate identification process. This leads to misidentifications and overlapping names in society. The Karangsari and Bangkok Merah cultivars are often considered the same, despite differences in habitus and fruit. This study aims to identify and examine the genetic relationships among starfruit (*Averrhoa carambola*) cultivars using morphological analysis and DNA barcoding with the Internal Transcribed Spacer (ITS) marker. The research samples consisted of five sweet starfruit cultivars found in starfruit plantations in Tarub Village, Grobogan Regency, Central Java. Cluster analysis was performed using the UPGMA method, and similarity indices were calculated based on the Simple Matching Coefficient. Phylogenetic tree reconstruction was conducted using MEGA 11 software with the Maximum Likelihood and Neighbor-Joining methods. The five *A. carambola* cultivars identified were Dewa, Dewi, Madu, Bangkok Merah, and Karangsari. Bangkok Merah and Karangsari cultivars showed a very close genetic relationship, as did the Dewa and Dewi cultivars. Meanwhile, the Madu variety is distinct from the others due to significant morphological and genetic differences. Haplotype analysis showed a high haplotype diversity value, with a haplotype diversity (hd) value of 0.98, indicating a wide genetic diversity within the studied starfruit population.

Keywords: *A. carambola*, DNA barcoding, biosystematics, phylogenetic analysis

Approved

Pembimbing I



Dr. Lilih Khotimperwati, S.Si, M.Si
NIP. 196903301994032001

Pembimbing II



Ni Kadek Dita Cahyani, S.Si, M.Si, Ph.D.
NIP. H.7.198012062022022001