ABSTRACT

The Fulgoridae Latreille, 1807 (Hemiptera: Fulgoromorpha) or lanternflies is a family of charismatic bugs that are known for their unique structure and striking colouration. Borneo being one of the world's biodiversity hotspots is known for its species richness residing in the tropical rainforests, including the Fulgoridae. The classification of Fulgoridae is not yet settled, and the monophyly of the family is still questioned especially on the position of genus *Zanna* and subfamily Dichopterinae. This is in part contributed by the lack of representatives from Emeljanov's putative subfamilies being Cladodipterinae, Dichopterinae, Lyncidinae, and Strongylodematinae in previous studies. This study aimed to rectify the phylogeny of this group based on 134 morphological characters across 28 species from Malaysian Borneo. The status of Dichopterinae has never been analysed within the monophyletic Fulgoridae before and is presented here for the first time. This study was based on voucher specimens from major repositories in Sarawak and Sabah, as well as new collections sampled in Sarawak. Results from neighbor-joining (NJ), maximum parsimony (MP) and Bayesian inference (BI) recovered the family as monophyletic including subfamily Dichopterinae and genus *Zanna*. There is a need to revise classification on the subfamily Aphaeninae as it was consistently not recovered as monophyletic in all three analyses. Fulgoridae also lacks a comprehensive systematic description. Descriptions were provided for four new taxa including the 21 previously described species from the family. Despite not being recognised as a bioindicator, Fulgoridae can be associated to forest which consists of old and large trees.

Keywords: Dichopterinae, Fulgoridae, phylogeny, systematic, *Zanna*

Sistematik dan Filogeni Fulgoridae Latreille, 1807 (Insecta: Hemiptera: Fulgoromorpha) dari Borneo Malaysia

ABSTRAK

Fulgoridae Latreille, 1807 (Hemiptera: Fulgoromorpha) atau "lanternflies" adalah famili kepinding karismatik yang terkenal dengan struktur unik dan warna yang menarik. Borneo adalah antara "hotspot" biodiversiti dunia, yang terkenal dengan kekayaan spesies di hutan hujan tropika, termasuk Fulgoridae. Klasifikasi Fulgoridae masih belum selesai dan monofili famili ini masih dipersoalkan terutamanya kedudukan genus Zanna dan subfamili Dichopterinae. Ini disebabkan oleh kekurangan wakil daripada subfamili Cladodipterinae, Dichopterinae, Lyncidinae, dan Strongylodematinae berdasarkan Emeljanov dalam kajian sebelum ini. Kajian ini bertujuan untuk menyelesaikan filogeni kumpulan ini berdasarkan 134 ciri morfologi yang melibatkan 28 taksa dari Borneo Malaysia. Status Dichopterinae tidak pernah dianalisis dalam monofiletik Fulgoridae dan dibentangkan di sini untuk kali pertama. Kajian ini menggunakan spesimen baucar dari repositori utama di Sarawak dan Sabah, termasuk pensampelan dari Sarawak. Hasil kajian menggunakan kaedah hubung kait jiran (NJ), parsimoni maksimum (MP) dan inferens Bayes (BI) menunjukan famili ini termasuk subfamili Dichopterinae dan genus Zanna adalah monofiletik. Semakan klasifikasi bagi subfamili Aphaeninae masih diperlukan kerana ketiga-tiga analisis tidak konsisten dan tidak monofiletik. Fulgoridae juga kekurangan pemerihalan sistematik yang komprehensif. Keterangan bagi empat taksa baru termasuk 21 spesies yang pernah dijelaskan sebelumnya dari famili ini disediakan. Walaupun tidak dikenali sebagai bioindikator, Fulgoridae boleh dikaitkan dengan hutan yang mempunyai pokok-pokok tua dan besar.

Kata kunci: *Dichopterinae, filogeni, Fulgoridae, sistematik, Zanna*