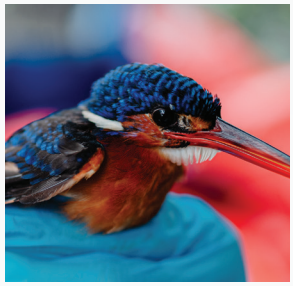
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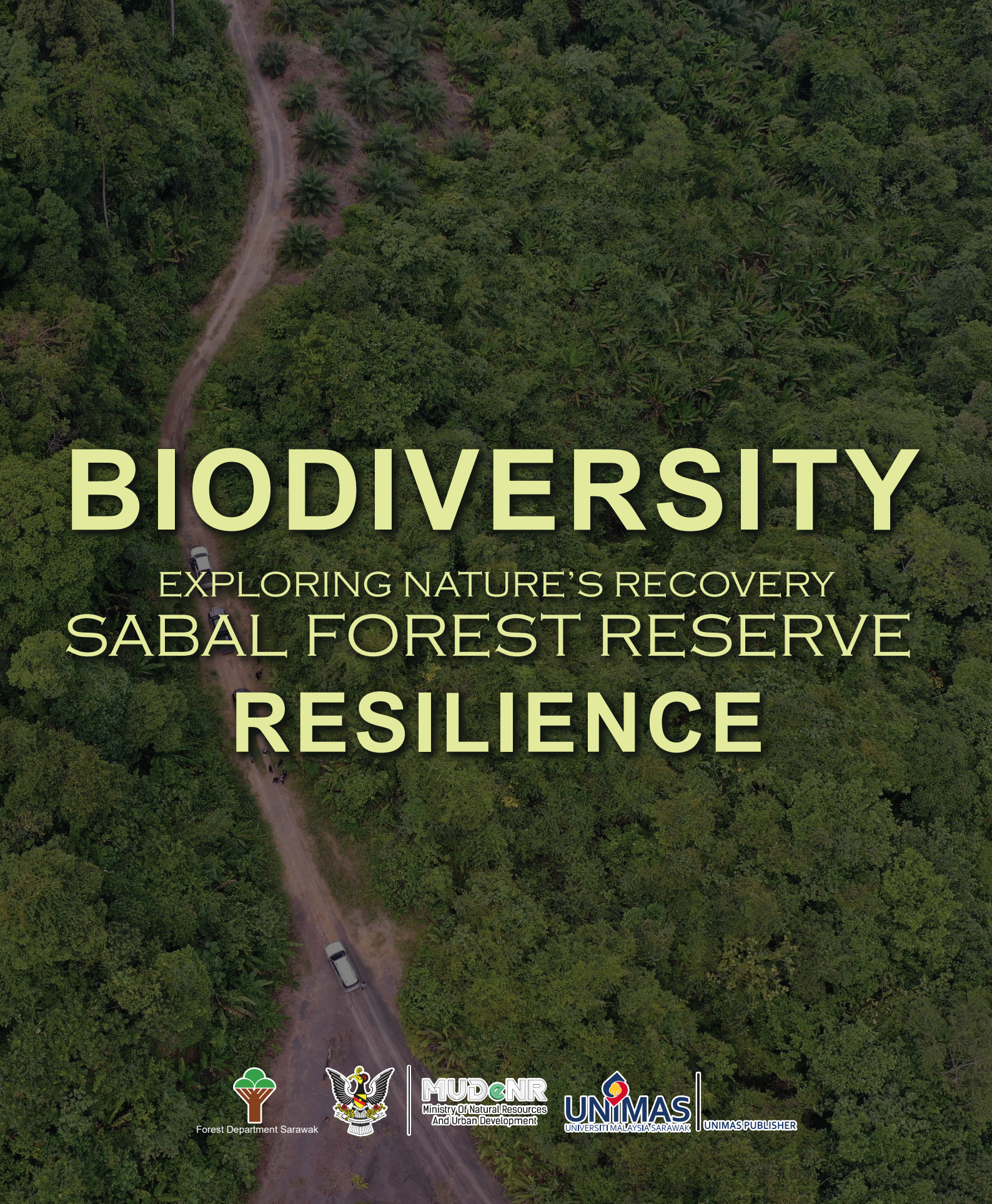





SABAL FOREST RESERVE

Edited By
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Forest Department Sarawak
MUDeNR Ministry Of Natural Resources And Urban Development
UNIMAS UNIVERSITI MALAYSIA SARAWAK



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By
Mohd Zacaery Khalik, Dayang Nuriza Abang Abdillah, Azahari Omar, Runi Anak Sylvester Pungga, Meekiong Kalu, Faisal Ali Anwarali Khan

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Carrion Flies

Madinah Adrus, Zulhilmi Mohamad Ismail, Natalie Faithfany Henry,
Nurul Farha Najwa Mohd Masdey & Nurul Ain Drahman

Carrion flies, primarily from the families Calliphoridae and Sarcophagidae, are insects that succeed on decomposing animal matter and play a vital role in nutrient recycling and ecosystem health. Their presence and activity help hasten the breakdown of organic material, making them important decomposers in both natural and urban environments. Studying the diversity and distribution of carrion flies in Malaysian Borneo is particularly lack and it was important due to the region's rich biodiversity and unique ecological conditions, which may host endemic or specialized species. Understanding their ecological roles, interactions with other organisms, and responses to environmental changes can provide insights into conservation strategies, forensic applications, and the impacts of urbanization and habitat fragmentation in tropical ecosystems. In this chapter, the species checklist related with its biology and ecological role including scientific importance of carrion flies will be explored with a focus on their presence in Sabal Forest Reserves.

Sabal Forest Reserve is located in Simunjan, Sarawak and covered about 2,613 hectares of tropical rainforest and forms part of Sarawak's Permanent Forest Estate. It serves as a key of an important center for sustainable land-use practices and biodiversity conservation. The reserve is home to a rich diversity of flora, including high-value indigenous tree species such as Belian (*Eusideroxylon zwageri*), Meranti (*Shorea* spp.), Selangan Batu (*Parashorea* spp.), and Kapur (*Dryobalanops* spp.), which provide critical habitats for wildlife. tropical forests, making it a key area for ecological studies.



Figure 1. *Modified Carrion Fly Traps*

Its fauna includes various mammals, birds, reptiles, and insects typical of lowland tropical forests, making it a key area for ecological studies.

Carrion flies (Diptera) were surveyed at the Sabal Forest Reserve between November 23 and November 29, 2024. A checklist of carrion flies was documented throughout the surveys. The passive method was used with modified carrion fly traps (Figure 1) containing three types of baits: rotten fish, chicken viscera, and cow flesh with nine replicates and three traps allocated for each bait type. All traps were set at 8.00 a.m. and left for exactly 24 hours before sample collection the following day to ensuring consistent exposure across all replicates.



Figure 2: *Chrysomya megacephala*

In total, the deployment of nine traps over three sampling days resulted in a sampling effort of 27 trap-days, equivalent to 648 trap-hours, reflecting the full duration each trap remained active throughout the study.



Figure 3: *Atherigona orientalis* Most common and abundance species in Sabal Forest Reserves

The sampling region recorded a total of 13 species (1,347 individuals) of carrion flies belonging to five families (Calliphoridae, Musidae, Platystomatidae, Phoridae and Sarcophagidae). *Atherigona orientalis* (Figure 2) was the most dominance and abundance species collecting and trapped during this survey followed by *Atherigona* species and *Chrysomya megacephala* (Figure 3). Majority of carrion flies' specimen were captured in chicken meat bait compared to others baits. Surprisingly, two species of fly did not belong to important in forensic flies but was caught in the traps which is known as signal fly, *Scholastes* species (Figure 4) and muscid fly, *Dichaetomyia luteiventris*. The checklist of carrion flies is presented below (Table 1).

Table 1. Checklist of Flies collected in Sabal Forest Reserve

Family	Species Name	No. of Individuals	Status
Calliphoridae	*Chrysomya megacephala*	265	Forensic important
	Chrysomya rufifacies	13	Forensic important
	Lucilia cuprina	9	Forensic important
	Hemipyrellia ligurriens	6	Forensic important
	Hypopygiopsis violacea	5	Forensic important
Musidae	*Atherigona orientalis*	561	Forensic important
	Atherigona sp.	295	Forensic important
	Dichaetomyia luteiventris	31	Not Forensic important
	Hydrotaea chalcogaster	40	Forensic important
Platystomatidae	*Scholaste* sp.	13	Not Forensic important
Phoridae	*Megaselia scalaris*	84	Forensic important
Sarcophagidae	*Boettcherisca karnyi*	8	Forensic important
	Sarcophaga gracilior	9	Forensic important

The checklist of carrion flies recorded in Sabal Forest Reserve demonstrates remarkable diversity, with 13 species identified (11 species of which are forensically important and 2 with uncertain forensic roles). This finding emphasizes the ecological richness of the reserve and its potential contribution to forensic entomology. Studying carrion flies is crucial because these species serve as biological indicators in decomposition processes, assisting in post-mortem interval estimation and supporting criminal investigations. Furthermore, documenting carrion flies' diversity provides essential baseline data for biodiversity conservation and ecological monitoring.



Figure 4: *Scholastes* sp.

Carrion Flies



Chrysomya rufifacies



Hypopygiopsis violacea



Lucilia cuprica



Dichaetomyia luteiventris



Hemipyrellia ligurriens



Megaselia scalaris



Boettcherisca karnyi



Sarcophaga gracilior

Figure 5. Other species of flies recorded at Sabal Forest Reserves

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