

Community composition and species diversity of fruit-eating-insects of *Gymnacranthera paniculata*, *Macaranga aleuritoides* and *Mastixiodendron pachyclado* in a Papua New Guinea Primary Forest

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Abstract— Community composition and species diversity of fruit-eating-insects were studied in a primary forest at Wanang, Madang, Papua New Guinea (PNG) using fruits regularly sampled and insects attacking them reared, preserved and identified. Sampling was done in different areas of the forest including low and high abundance of the host trees. Fruits of three predominant host trees, *G. paniculata* (Myristicaceae), *M. aleuritoides* (Euphorbiaceae) and *M. pachyclados* (Rubiaceae) were regularly collected and insects associated with them studied. The emergence from the fruits were 13 insect families and 16 species from *G. paniculata*, 17 insect families and 21 species from *M. aleuritoides* and 17 insect families and 25 species from *M. pachyclados*. Diversity assessment showed *M. pachyclados* was more diverse ($H=2.0258$) followed by *G. paniculata* ($H=2.007$). *M. aleuritoides* was the least diverse ($H=1.443$). A high percentage of scavengers and wood eaters were found in *G. paniculata* and *M. aleuritoides*. In *M. pachyclados*, more seed eaters, chewers and parasitoids were found instead. These results have implications for management of the community composition and diversity of the fruit-eating insects of the three host three species.

Keywords— Community composition, species diversity, fruit-eating-insects, Papua New Guinea.

I. INTRODUCTION

Frugivorous insect biodiversity has not been documented in New Guinea Forests in regard to their communities and composition on *G. paniculata*, *M. aleuritoides* and *M. pachyclados*. These trees are predominant in Wanang Conservation Area and throughout the New Guinea forests, and have economic importance to the local people. A tropical tree species supports a number of species of insect herbivores which are often large and unknown [1, 2]. [3] reared Dacine fruit flies (Tephritidae: Dacinae) from a sample size of more than 100 fruits weighing more than 1 kg of fruits from plant species while other insect taxa from this guild and seed predators in species of Lepidoptera, Coleoptera and Diptera were not studied [3]. A diversity of frugivorous insects exist in tropical forests were quantitatively reared. With 57 frugivorous weevil species representing 10,485 individuals from 326 woody plant species in lowland rain forest in PNG [4]. These frugivorous insects can be partitioned into two feeding guilds; mesocarp feeders (flesh feeders) and those feeding on endocarp (seed predators).

Plants possess chemical and mechanical defences in seeds versus mesocarp that adheres to these specific feeding guilds [4]. Seeds are often shield by high concentrations of secondary compounds [5, 6, 7, 8], thus contribute to narrow attack by group of specialized predators that possesses detoxifying counteract mechanisms unlike against generalists which lack such protection [9]. Scolytine beetles attack palms [10] while *Revena rubiginosa* Boheman (Curculionidae) predate on seeds of single-stemmed palm *Syagrus romanzoffiana* Cham (Arecaceae) [11, 12]. [13] recorded about 60% of fruit attack by seed predators in which weevils, katydids, and moth larvae were predominant on understory palm *Calyptrogyne ghiesbreghtiana* [14]. Most seed-beetles are oval shape [15] and have dietary specialization [16].

Parasitoids also strive with insect since they depend on them as hosts to complete their life cycles. [17] and [18] studied seven species of Braconid parasitoids under sub-family Opiinae: *Doryctobracon areolatus* Szépliget, *Utetes anastrephae* Viereck, and *Opius* sp. Muesebeck, and Alysiinae: *Asobara anastrephae* Muesebeck, *Phaenocarpa pericarpa* Foerster, *Idiasta delicata* Papp, and *Asobara* sp. Nees. [19] stated that Braconid wasps were frequently reared from *Cydia* sp. larvae (Tortricidae: Grapholitini) from understory palm (*Calyptrogyne ghiesbreghtiana* Linden) in Costa Rica where fruits containing *Cydia* have oviposition punctures of parasitoid and explains high parasitism due to few adults reared. Twenty-two