

## **A faunistic orientation visit in 2015 in the unexplored Kumawa Nature Reserve, South Bomberai Peninsula, Papua Barat, Indonesia (Lepidoptera)**

**Rob de Vos<sup>1</sup>, Daawia Suhartawan<sup>2</sup> & Erlani Rahareng<sup>3</sup>**

<sup>1</sup>Naturalis Biodiversity Center, Vondellaan 55, 2332AA Leiden, The Netherlands,  
email: rob.devos@naturalis.nl

<sup>2</sup>Kelompok Entomologi Papua, Waena, Papua, Indonesia, email: daawiasuhartawan@gmail.com

<sup>3</sup>email: erlani\_2402@yahoo.com

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*Abstract:* A report is given on a short visit in 2015 to Kumawa Nature Reserve, Buruway district, in the Southwest of Papua Barat. The area is characterized by pristine lowland rainforest with much wildlife, plants and animals. A list of the encountered Lepidoptera is presented and some interesting species are discussed.

*Rangkuman:* Sebuah laporan disampaikan pada sebuah kunjungan singkat pada tahun 2015 ke Cagar Alam Kumawa (Kumawa Nature Reserve), Distrik Buruway, di Barat Daya Provinsi Papua Barat. Kawasan ini dicirikan dengan hutan hujan dataran rendah yang masih primitif dengan banyak kehidupan liar, flora dan fauna. Daftar Lepidoptera yang ditemukan disajikan dan beberapa spesies menarik didiskusikan.

*Keywords:* Kumawa Mountains, Buruway district, Fyria river, orchids, Lepidoptera, nature reserve

### **Introduction**

In October 2015 the authors by coincidence had the opportunity to visit the pristine lowland rainforest along the Fyria river in the Kumawa Nature Reserve in the Buruway district in the south of Bomberai Peninsula, Papua Barat, Indonesia. The original plan was to go to Fakfak (Onin Peninsula) and the mountains behind it for an insect inventory but airplanes were not able to land in Fakfak for two weeks because of heavy smog caused by the many forest fires in South New Guinea. These fires were set for expanding oil palm plantations, a withering development.

Instead of Fakfak the authors stranded in Kaimana at the southwest coast of Papua. From there the authors could hire a boat from naturalist Gani Paulus, which son Osman could take them to the Kumawa Nature Reserve with a team of a boatsman, a policeman, a botanist and an assistant (fig. 1). The Government of Indonesia declared the Buruway area to be a national park in 1999, the Kumawa Nature Reserve. It covers an area of about 34,300 hectares with altitudes ranging from sea level up to 1,432 meters. Most of the area is covered with pristine moist lowland forest in the East and a montane forest on the slopes of the mountains in the West.

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The wetland habitats consist of coastal mangroves and beach vegetation. Although the visit was only for four days it made an unforgettable impression on the authors.

The forest was very dry because the weather phenomenon El Niño caused that it had not rained for at least three months. Three evenings an attempt was made to do collecting at light but the results were poor. Nevertheless all records made are new for the area so everything was documented or photographed. An overview of the identified results is given below.

### **Fyria River**

The Fyria river (3°55' S - 133°16' E) (fig. 2) is the first river effluent to the South at the East side of the Kumawa Mountains. Especially at the river mouth with the Arafura Sea it is wide but rapidly narrowing upstreams and can be penetrated by a longboat up to about 20 km inland. The Fyria river flows in a total pristine area which is different from the next and larger Buruway river where some small villages are located near the coast. The Fyria river is a tidal river (fig. 3) which means that the river at low tide at some places can be very shallow with dangerous sandbanks and obstacles like tree trunks. The shore of the river has a wealthy vegetation of primary lowland rainforest with mangrove, ferns and shrubs close to the water, bigger trees hanging full of orchids, epiphytes and beard mosses. In the trees next to the water are hanging thousands of fruit bats (Kalong) (fig. 4), accompanied by birds like kingfishers, hornbills and birds of paradise, on the sand and mud shores lie monitor lizards and in the forest run megapodes like the Maleo bird. In all these aspects it is clear that humans did not have had much influence in this forest yet.

### **Vegetation**

The lowland vegetation along the Fyria River was dominated by trees like *Myristica argentea*, *Pometia pinata*, *Alstonia scholaris*, *Rhizophora sp.*, *Terminalia catapa* and *Celthsis latifolia*. *Myristica argentea* (Papua nutmeg) (fig. 5 & 6) is an important tree that is found from sea level up to 1,200 meter in primary lowland forests on New Guinea. Its seeds have economic value as a famous spice. It is also a commercial source of an essential oil and nutmeg butter. Mace is the spice made from the reddish seed cover (aril) of the nutmeg seed. It is used to flavor bakery, meat, fish, vegetables and to preserve food.

The elevated coastline of the river is dominated by *Araucaria cunninghamii* (Hoop pine), *Paraserianthes falcataria* (white albizia), *Hopea papuana* (balau), *Podocarpus sp.* and *Pinus sp.* There is a high diversity of orchids around the Fyria River. *Dendrobium* (fig. 7) and *Bulbophyllum* (fig. 8) are dominant orchid genera in New Guinea, including along the Fyria River, where they grow with very dense colonies on the branches of high trees. The famous medium-sized to very large orchids that belong to the genus *Grammaphyllum* were also recorded. The pseudobulb of these orchids can grow to a length of 2.5 meters into gigantic clusters weighting from several kilograms to one ton. In New Guinea three species of *Grammaphyllum* occur: *G. pantherinum* (fig. 9), *G. stapeliiflorum* (fig. 10) and *G. scriptum* (fig. 11).

### **Nature Reserve**

The area and the forest is very pristine and should be protected against logging and burning. In the northern part of the Bomberai Peninsula destruction of the forest already takes place by logging and recently also by burning for future oil palm plantations. The Kumawa mountains, which are almost unexplored by biologists, and the southern part of the Bomberai Peninsula (Buruway district) should be spared from this destiny. The area is a refugium for animals and plants in a wide surrounding of cultivated and damaged landscape. Hopefully the status of national nature reserve will protect the area from being destroyed.

### **Lepidoptera fauna**

The three authors focussed mainly on Lepidoptera during their visit. A list (table 1) is presented of identified species which were encountered. It is obvious that this four days visit in a very dry season is not representative for the actual Lepidoptera fauna but is merely meant to be a trigger for more thorough inventory and research.

For collecting at light a generator and electricity wire was bought in Kaimana. A collecting sheet was custom made in Kaimana. In the Kumawa Nature Reserve the light was put on every evening but the results were poor. Most species which came to the light were photographed by the second author for a first identification. Many specimens still need a more thorough identification and will only be mentioned generally. Butterflies were collected at day time and identified in the field when possible.

### **Some worthwhile records**

In table 1 an overview is given of the about 120 Lepidoptera species which were recorded. Twenty-four families were represented by identified species, but as mentioned before, many of the specimens still need to be identified, especially microlepidoptera.

Four families of butterflies were represented but only few specimens were seen. Most abundant was *Danis danis* (Cramer, 1775), *Taenaris myops* (Fruhstorfer, 1907) and *Euthalia aeropa* (Linnaeus, 1758). *Delias lara* (Boisduval, 1836) (fig. 12) and *Perperes perperes* (Druce & Bethune-Baker, 1893) (fig. 13) usually are common butterflies but because of the dry circumstances they were rare during the visit.

Most abundant were species of Acentropiinae (Crambidae), without doubt originating from the nearby Fyria river. Most species belonged to *Eoophila trichoceralis* (Hampson, 1897) (fig. 14) and some other yet unidentified smaller *Eoophila* species. At some moments the screen was full of specimens of these moths.

A large and also very abundant moth was *Pseudophyllodes rubiginea* (Bethune-Baker, 1904) (fig. 15) (Lasiocampidae), which was very popular among the assisting local people. The size, colour of the abdomen (yellow-black bands) and restless behaviour of crawling and curling its long abdomen around your fingers when taken on the hand was a reason for excitement, fear and respect by the assistants.

The draught most likely caused that only one hawk moth showed up, the usually common *Hippotion boerhaviae* (Fabricius, 1775). On the other hand species of equal size from the Cossidae, which larvae live inside stems and trunks of trees, were rather common. Four *Trismelasmos* species of which one unidentified, three *Zeuzera* species and the rare and

recently described *Tarsozeuzera miklukhomaklayi* Yakovlev, 2011 (fig. 16) was found. Other wood borers like Xyloryctidae were represented by seven species, mostly common species, except for two species that might be endemics or new to science (Ian McMillan, pers. remark). More thorough study will follow. There was also only one representative of the emperor moths (Saturniidae), a female of an unidentified *Opodiphthera* species (fig. 17).

Other large moths that probably would have been more abundant if the conditions were not too dry are the large fruit piercers (Calpinae, Erebidae). We recorded *Eudocima (Othreis) iridescens* (Lucas, 1894) (fig. 18) and *Eudocima (Rhytia) muscigera* (Butler, 1882) of which the females of the first mentioned are very decorative.

Of the smaller moths *Hymenoptychis sordida* (Zeller, 1852) (fig. 19), *Palpita melanapicalis* Inoue, 1996 (fig. 20, a new species for Papua, Indonesia) (both Spilomelinae, Crambidae), *Boeotarcha taenialis* Snellen, 1880 (Odontiinae, Crambidae) (fig. 21) and *Procoronis swinhoeiana* (Walsingham, 1890) (Olethreutinae, Tortricidae) (fig. 22) are important records, but also some larger moths which usually are rare were recorded, like *Melanergon vidua* (Walker, 1865) (Eupterotidae) (fig. 23).

The many similar looking species of *Arctornis* and *Euproctis* (Erebidae, Lymantriinae) definitely need a thorough research and inevitably will lead to the discovery of new species. Species of this subfamily are known to be steady to their local distribution area and habitat and in most cases appear to be endemic species. The species are almost impossible to identify by wing pattern and colour alone. Other specimens that need to be identified with a closer look are from Limacodidae, Epipaschiinae (Pylalidae), Phycitinae (Pylalidae) and Thyrididae. These taxa seem to have less attention by lepidopterists, only little is known about those species from this region. The same goes for the numerous *Tolpiodes* species (Erebidae, Erebininae) (fig. 24), the smallest Erebidae known, together with the Hypenodinae *Pollex* and *Micronoctua*, of which Michael Fibiger (who died in 2011) was the only specialist and was never succeeded.

Species of Nolinae (Nolidae) (fig. 25) are presently being revised by Gyula Laszlo (i.m.) and will be published soon.

Most fascinating are two specimens of which even the families are not identified, let alone the species. Specialists are presently studying both to identify them. Results of these will follow later.

## Conclusions

It is obvious that the conditions for a proper inventory of the Lepidoptera fauna were very poor. Due to a draught of more than three months in the Buruway District, in October 2015 the soil was very dry, many small herbs were dried or dying or at least undeveloped, trees lost many leaves, the canopy was rather thin. The time that could be spend to collect was limited to only four days. All in all we can conclude that the result of about 100 recorded Lepidoptera species, of which many still unidentified and some even assumed to be new to science is not such a bad result after all. Moreover, it is clear that this area is very promising for future research in better conditions.

The presence of the abundant wildlife, like many bird species (i.e. birds of paradise, king fishers, Maleo birds, a.o.), monitor lizards, numerous fruit bats, but also many plants like numerous species of wild orchids, mosses, and flowering plants, indicate that the area is very pristine and

visited by us at an unfortunate moment. It is a good thing that the Indonesian Government in 1999 decided to pronounce this area to be a nature reserve. Let's hope that forest loggers and oil palm planters will respect its status.

**Acknowledgements**

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**Table 1.** Checklist of the species that were recorded in Kumawa Natural Reserve in 2015.

family	subfamily	genus	species	author spec	year auth.
Anthelidae		Anthela	charon	Bethune-Baker	1908
Anthelidae		Anthela	ekeikei	Bethune-Baker	1904
Callidulidae		Callidula			
Cossidae	Zeuzerinae	Tarsozeuzera	miklukhomaklayi	Yakovlev	2011
Cossidae	Zeuzerinae	Trismelasmos	albicans	Roepke	1955
Cossidae	Zeuzerinae	Trismelasmos	elegans	Roepke	1955
Cossidae	Zeuzerinae	Trismelasmos	minimum	Houlbert	1916
Cossidae	Zeuzerinae	Zeuzera	caudata	Joicey & Talbot	1916
Cossidae	Zeuzerinae	Zeuzera	reticulata	Joicey & Talbot	1916
Cossidae	Zeuzerinae	Zeuzera	indica	Herrich-Schäffer	1854
Crambidae	Acentropinae	Eoophyla	trichoceralis	Hampson	1897
Crambidae	Odontiinae	Autocharis	spec.		
Crambidae	Odontiinae	Boeotarcha	taenialis	Snellen	1880
Crambidae	Odontiinae	Dausara	talliusalis	Walker	1859
Crambidae	Odontiinae	Neogenesis	flaviplagialis	Hampson	1907
Crambidae	Pyraustinae	Hyalobathra	filialis	Guenée	1854
Crambidae	Pyraustinae	Pagyda	salvalis	Walker	1859
Crambidae	Pyraustinae	Paliga	ignealis	Walker	1866
Crambidae	Spilomelinae	Arthroschista	tricoloralis	Pagenstecher	1888
Crambidae	Spilomelinae	Bocchoris	distinctalis	Rothschild	1916
Crambidae	Spilomelinae	Cirrhochrista	figuratalis	Walker	1865
Crambidae	Spilomelinae	Dichocrocis	punctiferalis	Guenée	1854
Crambidae	Spilomelinae	Dracaenura	albonigralis	Hampson	1897
Crambidae	Spilomelinae	Herpetogramma	desmioides	Hampson	1899
Crambidae	Spilomelinae	Heterocnephes	lymphatalis	Swinhoe	1889
Crambidae	Spilomelinae	Hymenoptychis	sordida	Zeller	1852
Crambidae	Spilomelinae	Nosophora	althealis	Walker	1859
Crambidae	Spilomelinae	Palpita	melanapicalis	Inoue	1996
Crambidae	Spilomelinae	Tetridia	caletoralis	Walker	1859
Drepanidae	Drepaninae	Teldenia	strigosa	Warren	1903
Drepanidae	Drepaninae	Tridrepana	lunulata	Butler	1887
Erebidae	Anobinae	Crithote	pannicula	Swinhoe	1904

Erebidae	Anobiinae	Plecoptera	violacea	Pagenstecher	1884
Erebidae	Arctiinae	Asuridia	rutila	Walker	1864
Erebidae	Arctiinae	Cyme	phryctopa	Meyrick	1889
Erebidae	Arctiinae	Cyme	pyraula	Meyrick	1886
Erebidae	Arctiinae	Darantasia			
Erebidae	Arctiinae	Eugoa	sordida	Rothschild	1913
Erebidae	Arctiinae	Nishada	impervia	Walker	1864
Erebidae	Arctiinae	Parascaptia	biplagata	Bethune-Baker	1908
Erebidae	Arctiinae	Teulisna	bipunctata	Walker	1866
Erebidae	Arctiinae	Trischalis	iridescens	Rothschild	1913
Erebidae	Arctiinae	Utetheisa (Atasca)	pellex	Linnaeus	1758
Erebidae	Boletobiinae	Enispa	parva	Bethune-Baker	1906
Erebidae	Boletobiinae	Prolophota	acutiangulatalis	Rothschild	1916
Erebidae	Calpinae	Eudocima (Othreis)	iridescens	Lucas	1894
Erebidae	Calpinae	Eudocima (Rhytia)	muscigera	Butler	1882
Erebidae	Erebinae	Ercheia	dubia	Butler	1874
Erebidae	Erebinae	Stenocarsia	metaplatys	Hampson	1926
Erebidae	Eulepidotinae	Tochara	creberrima	Walker	1858
Erebidae	Lymantriinae	Dura	pratti	Bethune-Baker	1904
Erebidae	Lymantriinae	Leucoma	imprensa	Snellen	1877
Erebidae	Lymantriinae	Nygmia	rotunda	Bethune-Baker	1908
Erebidae	Pangraptinae	Focillodes	uncinata	Pagenstecher	1900
Erebidae	Pangraptinae	Pangrapta	aroa	Bethune-Baker	1906
Erebidae	Pangraptinae	Pangrapta	cryptoleuca	Hampson	1926
Erebidae	Pangraptinae	Pangrapta	ochraceum	Bethune-Baker	1908
Erebidae	Rivulinae	Bocula	lophoproctis	Hampson	1922
Erebidae	Rivulinae	Oglasa	costiplaga	Draudt	1950
Erebidae	Rivulinae	Oglasa	ochreovenata	Bethune-Baker	1906
Eupterotidae		Cotana	rubescens	Walker	1865
Eupterotidae		Melanergon	vidua	Walker	1865
Euteliidae	Euteliinae	Aplotelia	oetakwa	Holloway	1985
Geometridae	Desmobathrinae	Celerena	mutata	Walker	1865
Geometridae	Ennominae	Casbia	scardamiata	Warren	1898
Geometridae	Ennominae	Cleora	repetita	Butler	1882
Geometridae	Ennominae	Cypra	delicatula	Boisduval	1832
Geometridae	Ennominae	Fascellina	papuensis	Warren	1898
Geometridae	Geometrinae	Agathia	pisina ampla	Prout	1911
Geometridae	Geometrinae	Argyrocosma	consobrina	Warren	1896
Geometridae	Geometrinae	Chrysochloroma	electrica saturata	Warren	1912
Geometridae	Geometrinae	Comibaena	mariae syndyas	Prout	1916
Geometridae	Geometrinae	Dioscore	fulgurata	Warren	1897
Geometridae	Geometrinae	Dioscore	homoeotes	Prout	1911
Geometridae	Geometrinae	Eretmopus	marinaria	Guenée	1857
Geometridae	Geometrinae	Eucyclodes	absona	Warren	1896
Geometridae	Geometrinae	Eucyclodes	albiguttata	Warren	1912

Geometridae	Geometrinae	Eucyclodes	mimicaria	Prout	1913
Geometridae	Geometrinae	Metallochloa	decorata	Warren	1896
Geometridae	Geometrinae	Spaniocentra	gibbosa	Prout	1911
Geometridae	Geometrinae	Thalassodes	dorsilinea	Warren	1903
Geometridae	Geometrinae	Thalassodes	pilaria	Guenée	1858
Geometridae	Sterrhinae	Organopoda	olivescens	Warren	1896
Hesperiidae	Coeliadinae	Allora	major	Rothschild	1916
Lacturidae		Lactura	heliantha	Meyrick	1918
Lasiocampidae		Pseudophyllodes	rubiginea	Bethune-Baker	1904
Lycaenidae	Curetinae	Curetis	barsine	Felder	1860
Lycaenidae	Lycaeninae	Danis	danis	Cramer	1775
Lycaenidae	Lycaeninae	Hypochrysops	polycletus	Linnaeus	1758
Lycaenidae	Lycaeninae	Jamides	cytus	Boisduval	1832
Lycaenidae	Lycaeninae	Nacaduba	cyanea	Cramer	1775
Lycaenidae	Lycaeninae	Perperes	perperes	Druce & Beth.-B.	1893
Noctuidae	Aediinae	Aedia	acronyctoides	Guenée	1852
Nolidae	Chloephorinae	Etanna	albisepta	Hampson	1905
Nolidae	Chloephorinae	Etanna	breviuscula	Walker	1863
Nolidae	Nolinae	Nola	diagona	Hampson	1911
Nolidae	Nolinae	Nola	interrupta	Pagenstecher	1894
Nolidae	Westermanniinae	Urbona	tamsi	Van Eecke	1924
Notodontidae		Kamalia			
Nymphalidae	Danainae	Danaus	affinis	Fabricius	1775
Nymphalidae	Danainae	Ideopsis	juventa	Cramer	1777
Nymphalidae	Heliconiinae	Cethosia	cydippe	Linnaeus	1763
Nymphalidae	Morphinae	Taenaris	myops	C. & R. Felder	1860
Nymphalidae	Nymphalinae	Euthalia	aeropa	Linnaeus	1758
Nymphalidae	Nymphalinae	Mynes	geoffroyi	Guerin-Meneville	1831
Nymphalidae	Satyrinae	Elymnias	agondas	Boisduval	1832
Papilionidae	Papilioninae	Atrophaneura	polydorus	Staudinger	1893
Pieridae	Pierinae	Appias	celestina	Fruhstorfer	1910
Pieridae	Pierinae	Delias	lara	Boisduval	1836
Pieridae	Pierinae	Eurema	puella	Fabricius	1775
Pieridae	Pierinae	Saletara	liberia	Cramer	1779
Psychidae		Eumeta	layardii	Moore	1892
Saturniidae	Saturniinae	Opodiphthera			
Sphingidae	Macroglossinae	Hippotion	boerhaviae	Fabricius	1775
Uraniidae	Epipleminae	Phazaca	erectinota	Warren	1899
Xyloryctidae		Caenorycta			
Xyloryctidae		Caenorycta	xylomima	Meyrick	1917
Xyloryctidae		Cryptophasa	argophanta	Meyrick	1917
Xyloryctidae		Pansecta	tunsa	Diakonoff	1954
Xyloryctidae		Paralecta			
Xyloryctidae		Stachyneura	iostigma	Diakonoff	1948
Xyloryctidae		Thymiatrix			



**Fig. 1.** The survey team in Kumawa Nature Reserve. From left to right: Native policeman, Erlani Rahareng, Osman Paulus, Rob de Vos, native policeman, native botanist, Daawia Suhartawan (photo: automatic shutter)

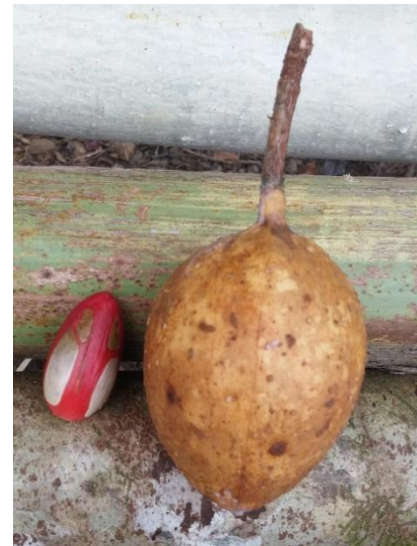


**Fig. 2-3.** The Fyria River in the Kumawa Nature Reserve. Figure 3 shows the sandy tidal coast line (photo: fig. 2, Daawia Suhartawan; fig. 3, Rob de Vos)





**Fig. 4.** Kalong (fruit bats) are filling the sky with thousands of them along the coast of the Fyria River. (photo: Rob de Vos)



**Fig. 5-6.** *Myristica argentea* (Papua nutmeg). (photos: Daawia Suhartawan)



**Fig. 7.** *Dendrobium capituliflorum*; **fig. 8.** *Bulbophyllum graveolens*. (photos: Daawia Suhartawan)



**Fig. 9.** *Grammatophyllum pantherinum*. (photo: Daawia Suhartawan)



**Fig. 10.** *Grammatophyllum stapeliiflorum*; **fig. 11.** *Grammatophyllum scriptum*.  
(photos: Daawia Suhartawan)



**Fig. 12.** *Delias lara* (Boisduval, 1836); **fig. 13.** *Perpheres perpheres* (Bruce & Bethune-Baker, 1893)  
(photos: Daawia Suhartawan)



**Fig. 14.** *Eoophyla trichoceralis* (Hampson, 1897); **fig. 15.** *Pseudophyllodes rubiginea* (Bethune-Baker, 1904) (photos: Daawia Suhartawan)



**Fig. 16.** *Tarsozeuzera miklukhomaklayi* Yakovlev, 2011; **fig. 17.** *Opodiphthera* spec. (photo 16: Rob de Vos; photo 17: Daawia Suhartawan)



**Fig. 18.** *Eudocima (Othreis) iridescens* (Lucas, 1894); **Fig. 19.** *Hymenoptychis sordida* (Zeller, 1852) (photo 15: Daawia Suhartawan; photo 16: Rob de Vos)



**Fig. 20.** *Palpita melanapicalis* Inoue, 1996; **Fig. 21.** *Boeotarcha taenialis* Snellen, 1880  
(photos: Rob de Vos)



**Fig. 22.** *Procoronis swinhoeiana* (Walsingham, 1890); **Fig. 23.** *Melanergon vidua* (Walker, 1865)  
(photos: Rob de Vos)



**Fig. 24.** *Tolpiodes* spec.; **Fig. 25.** *Nola interrupta* Pagenstecher, 1884. (photos: Rob de Vos)