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A new Alucitidae species from Taiwan

(Lepidoptera, Alucitidae)

Contribution to the moths of Taiwan 15*

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The species *Pterotopteryx formosana* sp. nov. is described from Chenggong Township in Taitung County. The new species and its closest relative are figured with their male genitalia. It is the second Alucitidae species recorded from Taiwan. A figure of the living imago on the screen is attached. The species morphologically most similar to it is *P. spilodesma* (Meyrick, 1908), but it is clearly different in the wing markings as well as in the genital structures. The biotope at the light trap is an island-like temporary rainforest relict.

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Introduction

Taiwan is a small Island east of China and south of Japan and north of the Philippines. More than ⅔ of Taiwan are high mountains with elevations of more than 1500 m NN.

The authors already have more than 15 years experience in the investigation of the insect fauna of Taiwan with special focus on Lepidoptera. It starts with the DAAD project No.: ID D/0039914, PPP-Taiwan, in the year 2001. From this time many more excursions in cooperation e. g. with the Highland Experimental Farm Meifeng were undertaken. Some results about the Taiwanese moth fauna were already published in the frame of these projects and after additional trips to Taiwan, e. g. Buchsbaum & Miller 2002, Buchsbaum et al. 2006, Schacht et al. 2010, Buchsbaum & Chen 2013, Chen et al. 2013.

Taiwan is one of the biodiversity hotspots in the world. It is also an area with a high number of endemic species and it is on the priority list of ecoregions for global conservation (Myers et al. 2000, Brooks et al. 2002, Olson & Dinerstein 2002, Sodhi et al. 2004, Kier et al. 2009, Woodruff 2010).

Alucitidae

This small family contains about 210 species in 9 genera all over the world (Gielis 2003, Byun 2006, Gielis 2009, Ustjuzhanin & Kovtunovich 2014, Ustjuzhanin et al. 2016). Most of them are known from the Afrotropical region and from South Africa, followed by Europe and South America (Gielis 2003). In Europe, 16 species are recorded (Sutter 1990, Karsholt & Razowski 1996). Only one species, *Alucita spilodesma* (Meyrick, 1908) is so far known from Taiwan (Hepp-

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Fig. 1. Map of Taiwan with type locality (●).
Figs 2–3. Biotop/habitat at type locality.

ner & Inoue 1992) with certainty. Heppner (2012) also listed *A. flavofascia* (Inoue, 1959) for Taiwan, without any comments about exact locality records from Taiwan. Five Alucitidae species are known from Japan, and six species are recorded from China (Hashimoto 1984, Gielis 2003).

The new species differs clearly from the species known from Taiwan and also from all species occurring in the region from Japan, Korea and from China.

Alucitidae occur in different habitats and landscapes so that they are not restricted to a special biotope. Only few biological data are know from the Alucitidae of that region (Byun 2006).

Material, methods and locality

Two males are collected at light. The collection site is situated in Southeast Taiwan, near Taitung (Fig. 1). The habitat is a temporary rainforest "island" near the coast (Figs 2 and 3) in an elevation of about 120 m NN. The moths were attracted by light. The lamp used was a 250 W mixed light lamp in front of a white screen. The specimens were collected in January, 05 2016. This day was warm, about 22 °C, cloudy, and in the evening some rain started.

The specimens were put in poison glasses and after they died were pinned and later spread on a normal spreading board.

Genitalia preparation was done with KOH 10 % and the genitalia mounted in Euparal.

Taxonomy

Byun (2006) transfered *Alucita spilodesma* (Meyrick, 1907) to the genus *Pterotopteryx* Hannemann, 1959. He followed the diagnosis of Hannemann (1959) in the introduction of this new combination because of the wing venation and the differences in the male genitalia. The valvae are larger and wider, rounded, and the uncus is rounder and not forked.

The new species here described shows the same characteristics so that the authors place the species in this genus.

Fig. 4. *Pterotopteryx formosana* sp. nov., holotype.
Fig. 5. *Pterotopteryx formosana* sp. nov., paratype
Figs 6–7. *Pterotopteryx formosana* sp. nov., holo- and paratype resting on screen.

Pterotopteryx formosana sp. nov.
Figs 4–9

Types. Holotype ♂: January, 05 2016, Southeast Taiwan, Chenggong Township, 120 m NN, Taitung County, 23°10'16"N / 121°23'36"E, leg. Mei-Yu Chen & Ulf Buchsbaum, in Coll. National Museum of Natural Science Taichung (NMNS). – Paratype ♂: same data than holotype, in Coll. Zoologische Staatssammlung München (ZSM).

Etymology. The new species is called *P. formosana*, because Taiwan is also known as Formosa which means nice or beautiful island.

Description and differential diagnoses

♂ wingspan 14–15 mm, ∅: 14.5 mm, right forewing length: 6 mm, ∅: 6 mm.

Head, body and abdomen greyish brown. Abdomen with three large white dots on segments two, four and six. Labial palpus ⅓ larger than eye size, greyish with brown hairs. In *P. spilodesma*, more than double as long than eye size and yellowish grey with brown rings on the segments.

Forewing divided in six and hindwing in 5 lobes which is normal in most Alucitidae. All lobes of the forewings greyish brown interrupted with small narrow white spots. Hindwing greyish white with small brownish spots.

Next similar species in wing colouration is *Alucita japonica* Matsumara, 1931. However, in this species the abdomen is black without white dots and there is a different wing venation which is the reason why it is placed in the genus *Alucita* rather than in *Pterotoperyx* like the present new species. *P. spilodesma*, the only *Pterotoperyx* species known from Taiwan, is larger. Ground colour is yellowish brown.

Male genitalia: Uncus dull, rounded and slim. Valva short, Socii heart-shaped. Saccus narrow and long. In *Alucita japonica*, the uncus is forked, the valvae are much larger. Aedeagus is squat with dull rounded coecum in *P. formosana*. Aedeagus from *P. spilodesma* and also from *A. japonica* is slender and longer. Aedeagus of *P. formosana* with many cornuti, about three longer and 19 smaller ones. In *P. silodesma*, there are only some small cornuti and in *A. japonica* cornuti are absent.

DNA analyses

The following sequences were obtained for the COI gene and were processed according to the methodes of the BOLD System. In the absence of comparable species in BOLD, only the available sequences are shown here.

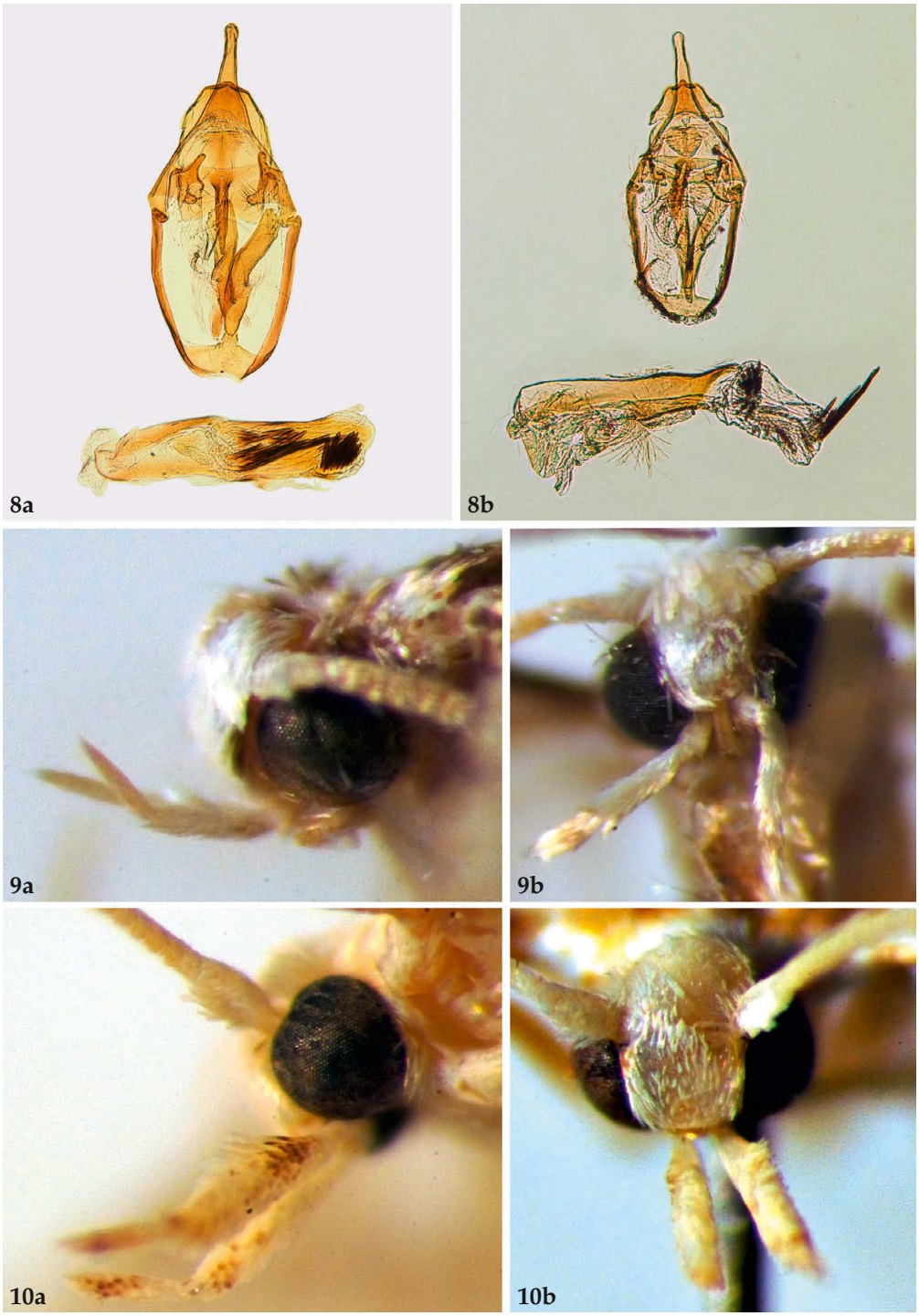

Fig. 8. Male genitalia with everted vesica; **a.** holotype; **b.** paratype.
Fig. 9. Head of *Pterotoptera formosana* sp. nov. **a.** lateral view; **b.** frontal view.
Fig. 10. Head of *Pterotoptera spilodesma*. **a.** lateral view; **b.** frontal view.

Sample ID: BC ZSM Lep 90617; Process ID: GWORL1308-16; BIN: BOLD:ADA9320

Sequence: 658 bp

AACTTTATAT TTTATTTTTG GGATTTGAGC AGGATTATTG
GGTACATCTT TAAGATTATT AATTCGGGCT GAATTAGGTA
ATCCAGGTTC ATTAATTGGG GACGATCAAA TTTATAATAC
AATTGTCACT GCCCATGCTT TTATTATAAT TTTTTTTATA
GTTATACCTA TTATAATTGG AGGATTTGGG AATTGATTAG
TGCCTTTAAT ATTAGGGGCT CCCGATATAG CTTTCCCGCG
AATAAATAAC ATAAGATTTT GATTATTACC ACCTTCAATT
TTATTATTAA TTTTTAGTAT AATTGTTGAA AATGGTGCAG
GAACAGGTTG AACAGTGTAC CCCCCACTTT CATCTAATAT
TGCACATAGA GGTAGATCTG TTGATTTAAC AATTTTTTCT
TTACATTTAG CTGGAATTTC TTCTATTTTA GGTGCAATTA
ATTTTATTAC AACAGTTATT AATATAAAAA TTAATGGATT
AATATTTGAT CAAATACCAT TATTCGTTTG AGCGGTTAGT
ATTACAGCAT TATTATTATT ATTATCATTA CCTGTGCTAG
CAGGTGCTAT CACTATATTA TTAACTGATC GAAATTTAAA
TACTTCATTT TTTGACCCTG CTGGTGGGGG CGATCCAATT
TTATATCAAC ACTTATTT

Composition: A (197), G (103), C (90), T (268)

Sample ID: BC ZSM Lep 90618; Process ID: GWORL1309-16; BIN: BOLD:ADA9320

Sequence: 658 bp

AACTTTATAT TTTATTTTTG GGATTTGAGC AGGATTATTG
GGTACATCTT TAAGATTATT AATTCGGGCT GAATTAGGTA
ATCCAGGTTC ATTAATTGGG GACGATCAAA TTTATAATAC
AATTGTCACT GCCCATGCTT TTATTATAAT TTTTTTTATA
GTTATACCTA TTATAATTGG AGGATTTGGG AATTGATTAG
TGCCTTTAAT ATTAGGGGCT CCCGATATAG CTTTCCCGCG
AATAAATAAC ATAAGATTTT GATTATTACC ACCTTCAATT
TTATTATTAA TTTTTAGTAT AATTGTTGAA AATGGTGCAG
GAACAGGTTG AACAGTGTAC CCCCCACTTT CATCTAATAT
TGCACATAGA GGTAGATCTG TTGATTTAAC AATTTTTTCT
TTACATTTAG CTGGAATTTC TTCTATTTTA GGTGCAATTA
ATTTTATTAC AACAGTTATT AATATAAAAA TTAATGGATT
AATATTTGAT CAAATACCAT TATTCGTTTG AGCGGTTAGT
ATTACAGCAT TATTATTATT ATTATCATTA CCTGTGCTAG
CAGGTGCTAT CACTATATTA TTAACTGATC GAAATTTAAA
TACTTCATTT TTTGACCCTG CTGGTGGGGG CGATCCAATT
TTATATCAAC ACTTATTT

Composition: A (197), G (103), C (90), T (268)

Discussion

The new species was collected in a temporary rainforest in the southeast of Taiwan. This southeastern region (of Taiwan) is closer related to the Southeast Asia fauna (Oriental region) in zoogeographical aspects than other parts of Taiwan (e. g. Turner et al. 2001, Schintlmeister 2003, Chao et al. 2010). Some plants are endemic on Taiwan in this area and some are closer related to the Philippines (Hsieh 2002). Same as some moths species, e. g. of the genus *Macroglossum* Scopuli, 1777 (Sphingidae). In this genus some only occur in Taiwan in the east, southeast and south part of Taiwan (Yen et al. 2003).

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