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A new species of Alucitidae from Lanyu Island, Taiwan

(Lepidoptera, Alucitidae)

Contributions to the moths of Taiwan 22*

Contributions to Alucitidae 3

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The new species *Alucita kehmiini* Buchsbaum & Chen sp. nov. is described. The new species was found on Lanyu Island (Taiwan) at the already known type locality of several other new species, the Weather Station of the island, and is compared with the most similar species *A. spilodesma* and *A. japonica* from which it differs in the wing pattern and structure of the genitalia.

Zusammenfassung: Die neue Art *Alucita kehmiini* Buchsbaum & Chen sp. nov. wird beschrieben. Die neue Art wurde auf Lanyu Island (Taiwan) am bereits bekannten Typenfundort mehrerer anderer neuer Arten, der Wetterstation der Insel, gefunden und wird mit den ähnlichsten Arten *A. spilodesma* und *A. japonica* verglichen, von denen sie in der Flügelzeichnung und den Genitalstrukturen abweicht.

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Introduction

During a research and collection trip on Lanyu Island (Taiwan) the authors collected at the Weather Station on Lanyu Island. This place is already type locality for some other moths (e. g. Buchsbaum et al. 2018, Chen et al. 2018, Hsu et al. 2018, Buchsbaum et al. 2020).

More data about this collection site are already published (Hsu et al. 2018, Buchsbaum et al. 2020). This place is an exposed site in the southeast central hills. The small island Lanyu also called Orchid Island is situated northwest of the Philippine islands and close to the main country Taiwan. Lanyu Island therefore has a very special position between the Palearctic and the Oriental fauna and many endemic species are already known from this Island (e. g. Li & Keng 1950, Li 1953, Seong 1976, Chen et al. 2017, Tseng et al. 2017, Buchsbaum et al. 2020). For this reason, Lanyu Island is highly interesting for biogeographical research.

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Figs 1–2. Biotope around the type locality of *Alucita kehmiini* sp. nov.

The project to investigate and record the insect fauna of Taiwan started 2001 with the DAAD Project no. ID D / 0039914 PPP-Taiwan. Afterwards, many more collection and research trips to Taiwan were made in cooperation with the Highland Experimental Farm.

Meifeng of the National Taiwan University (NTU) and later with the Da-Yeh University in Changhua. Many papers resulted from these research trips (e. g. Buchsbaum & Miller 2002, Buchsbaum et al. 2006, Chen 2009, Buchsbaum & Chen 2013, Chen et al. 2013, Buchsbaum et al. 2018, Buchsbaum & Grehan 2019, Chen & Buchsbaum 2020, Buchsbaum et al. 2023, Chen et al. 2023).

Material and methods

The collection was done with a 250 W mix light lamp on the top of the Weather station hill. The lamp was placed in front of a white screen. Collection time was from about 07:00 pm to around midnight.

The locality Weather Station on Lanyu Island is well known as type locality for already many new species. It is an exposed place on the top of a small hill beside the weather station and is surrounded with natural bush vegetation (Figs 1 and 2).

The specimens were collected in poison glasses (KCN) and after death immediately pinned and prepared for transport. At home, the specimens were prepared on a micro spreading board. Genitalia preparation followed Robinson (1976) with 10 % KOH and the genitalia were finally mounted in Euparal. Photos were taken with Olympus Tough TG-6.

Fig. 3. Holotype of *Alucita kehmiini* sp. nov.

Fig. 4. Holotype of *Alucita kehmiini* sp. nov., ventral side.

Fig. 5. Female genitalia of *Alucita kehmiini* sp. nov., holotype.

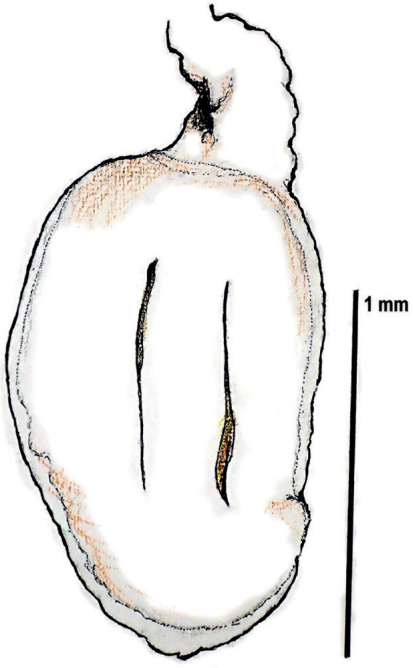

Fig. 6. Detailed part of bursa copulatrix of *Alucita kehmiini* sp. nov. (drawing: Mei-Yu Chen).

Alucitidae

About 210 species of Alucitidae are known worldwide belonging to 9 genera (Gielis 2003, Byun 2006, Gielis 2009, Ustjuzhanin & Kovtunovich 2014, Ustjuzhanin et al. 2016). Four species are known until now from Taiwan (Buchsbaum & Chen 2019, Buchsbaum et al. 2020). With this new species, the fifth species is recorded from Taiwan, with now two species from Lanyu Island (Buchsbaum et al. 2020).

Most of the Alucitidae species occur in the Palaearctic region (Gielis 2003, 2009). Five species are known from Japan and six species are recorded from China (Hashimoto 1984, Gielis 2003). Only few data about the biology of the Asian Alucitidae are known (Sutter 1990, Byun 2006).

Alucita kehmiini Buchsbaum & Chen sp. nov.

Figs 3–10

Holotype: ♀, 20.V.2024, South Taiwan, Taitung Co., Lanyu Island, Weather Station, 310 m NN, 121°33'29" E 22°02'15" N, leg. M.-Y. Chen & U. Buchsbaum. Holotype in Coll. Ulf Buchsbaum, Kranichfeld (CUBK), to be later transferred and deposited in the National Museum of Natural Science (NMNS), Taichung, Taiwan.

Description and differential diagnoses

Wingspan: ♀, 19 mm; right forewing length: 8 mm.

Head, body, antenna yellowish. In *A. spilodesma*, head, body and antenna are covered with whitish creamy-grey scales and in *A. japonica* with brownish grey ones. Abdomen pale brown. Labial palpus pale yellow with brown tip, twice as long as eye size. Forewing and hindwing with six lobes. Ground colour pale yellow. Second lobe on forewing with brown dot. All lobes medially brownish and orange. The three middle lobes of the hindwing sub-basally brown. Sixth lobe shorter than the other. *A. spilodesma* (wingspan 14 mm), and *A. japonica* (wingspan 13 mm) smaller. Ground colour of the underside greyish yellow.

Female genitalia: Papillae anales narrow, hairy, terminally rounded. Apophyses posteriores sclerotized, as long as papillae anales. Apophyses anteriores 1/3 longer than apophyses posteriores, similarly sclerotized. Corpus bursae less sclerotized, egg-shaped, rounded. Two thin, long, stronger sclerotized signa. *A. spilodesma* and *A. japonica* without such signa. *A. japonica* with small star-shaped signum and *A. spilodesma* with many small, thin signa.

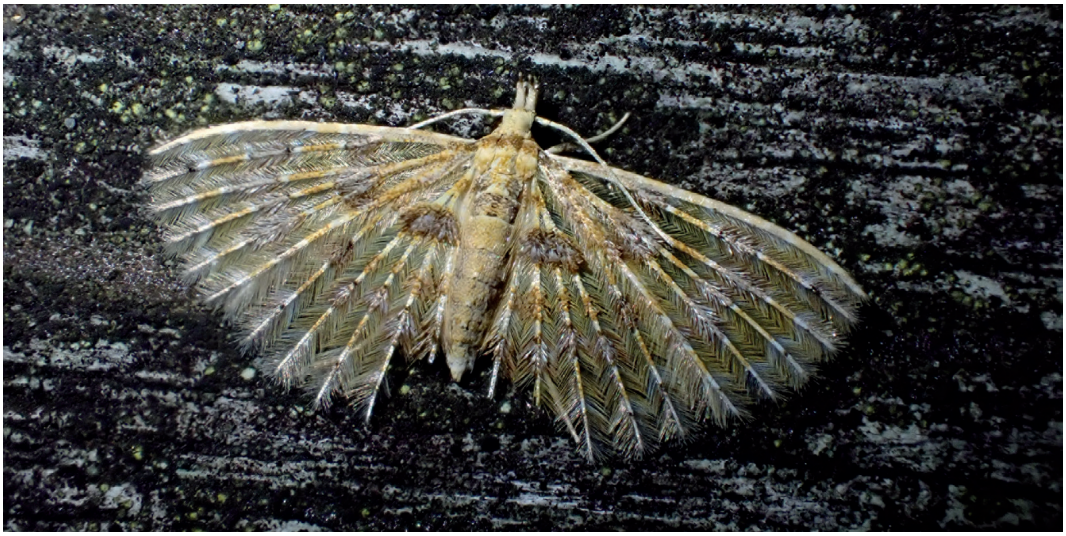

Fig. 7. *Alucita kehmiini* sp. nov., live resting on screen.

Etymology. The new species *Alucita kehmiini* sp. nov. is dedicated to Keh-miin Chen, who is the initiator of the DAAD Project for Taiwan research and a good friend of us who always helps us in our further research in Taiwan.

Discussion

The zoogeographical situation of Lanyu Island makes this place to a highly interesting Island. Until now, only little is known about the insect fauna and also other animals and plants. That's the reason why new species can still be recorded quite often.

Already Yen et al. (2003) discussed the geological association of the Philippines with Lanyu Island and the biogeographical evidence. Kano (1932 a, b, c, d)

Table 1. Differences in morphological characters and distribution of the most similar *Alucita* species.

	Alucita kehmiini sp. nov.	*Alucita spilodesma*	*Alucita japonica*
Head and thorax	Yellowish	Whitish creamy grey	Brownish grey
Body	Pale brownish	Dark brownish grey	Brown, dark brown
Labial palpus	Pale yellow with brown tip	Whitish ash grey	Brownish grey
Wings (in all: hindwings similar to forewings in coloration)	Pale yellow with brown dot on second lobe, brownish with orange on all lobes	Whitish ash grey	Greyish brown with six fuscous brown, evenly spaced marks along costa
Wingspan	19 mm	14 mm	13 mm
Female genitalia	Papillae anales narrow, hairy, terminally rounded, corpus bursae egg-shaped, rounded with two thin, long strong sclerotized signa	Papillae anales narrowed terminally, corpus bursae triangular, with irregularly shaped signum near middle, composed of more than 30 small spinules (after Byun 2006)	Papillae anales slender narrowed terminally, corpus bursae long ovate, minutely spiculated from junction, small stellate signum near middle, ductus bursae very short (after Byun 2006)
Distribution	Lanyu Island, Taiwan	Japan, Korea, Russia (Far East, Sakhalin Island), Taiwan, Philippines, India	Okinawa Islands, Japan

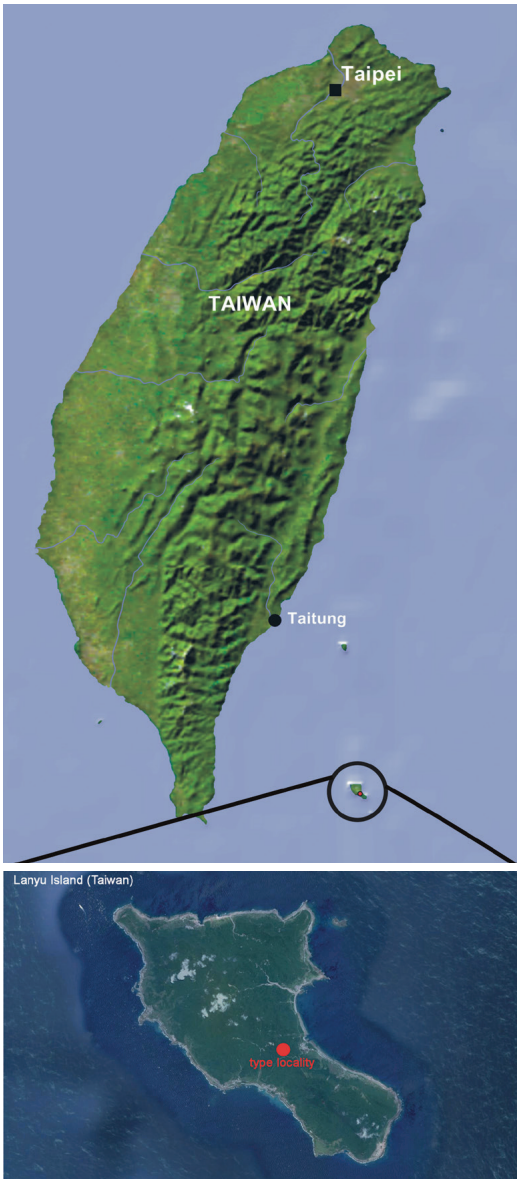

Fig. 8. Map of the type locality of *Alucita kehmiini* sp. nov.

Figs 9–10. Labial palps and head from front of *Alucita kehmiini* sp. nov., holotype.

considered the biogeographical aspects in birds and insects (e. g. butterflies and dragonflies). Kano (1932e, 1933) refers to the zoogeographical significance and correlations between Lanyu Island and the adjected territories. With examples of birds, amphibians and mammals, the Wallace Line is defined to be between the Orchid Island and Taiwan (Kano 1933, Schintlmeister 2003, Yen et al. 2003, Fa & Funk 2007, Holt et al. 2013, Rueda et al. 2013). These aspects create mixtures of flora and fauna of the subtropical and tropical parts of Taiwan and the Philippines (Lin 1989, Mey & Speidel 2003). Schintlmeister (2003) speculates about the different faunal elements with the example of the Notodontidae (Lepidoptera) in the East and the Southeast Asian region. The correlation between Lanyu Island and the Philippines and between Lanyu and the South Japanese Islands is also illustrated in plants (Li & Keng 1950, Li 1953, Seong 1976).

Endemic species were already described in the last decades (e. g. Seong 1976, Lin, 1989, Hsieh 2002, Shen & Tsai 2002, Yen et al. 2003, Fa & Funk 2007, Yeh et al. 2008, Huang 2011, Yang & Lin 2013, Siler et al. 2014, Watanabe et al. 2015, Hsu et al. 2017, Späth et al. 2018).

Another interesting aspect of Lanyu is that the island is a step stone for distribution and spreading of some species, e. g. species of the flightless *Pachyrhynchus* genus (Coleoptera, Curculionidae), as well as the Five-lined Skink (*Plestiodon marginatus* (Reptilia: Scincidae) and the Japanese Paradise-

Flycatcher (*Terpsiphone atrrocaudata periphthalmica*) (Honda et al. 2008, Siler et al. 2014, Tseng et al. 2017, 2020, Rukmane 2018, Späth et al. 2018).

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