

A new Nolidae species in the genus *Pseudoips* Hübner, 1822 from Taiwan (Insecta: Lepidoptera) Contributions to the moths of Taiwan 18¹

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Zusammenfassung

Die Nolidae – Art *Pseudoips taiwana* sp. n. wird beschrieben und der Fundort abgebildet. Es werden die Unterschiede zu den Arten *P. sylpha* (Butler, 1879) und *P. prasinana* (Linnaeus, 1758) dargestellt und erläutert. Der in HEPPNER & INOUE (1992) aufgelistete Name *P. sylphina*, der sich wahrscheinlich auf die vorliegende Art bezieht, wird in HEPPNER (2012) als nomen nudum erklärt. Die neue Art *P. taiwana* sp. n. ist nur vom Typenfundort bekannt. Die Biologie ist unbekannt. Die bekannten Tiere wurden am Licht gefangen.

Summary

The Nolidae – species *Pseudoips taiwana* sp. n. is described and the locality illustrated. The differences to the species *P. sylpha* (Butler, 1879) and *P. prasinana* (Linnaeus, 1758) are presented and explained. The species *P. sylphina* listed in HEPPNER & INOUE (1992) is explained in HEPPNER (2012) as nomen nudum. The new species *P. taiwana* sp. n. is only known from the type locality. The biology is unknown. The recorded specimens of the new species were caught by the light.

Key words: Lepidoptera, Nolidae, *Pseudoips taiwana* sp. n., Asia, Taiwan, taxonomy, distribution

Introduction

Research about the Insect fauna of Taiwan starts with the DAAD project (No.: ID D/0039914 PPP-Taiwan) in the year 2001 with the National Chung Hsing University (CHU) Taichung and goes on in cooperation with the Meifeng Highland Experimental Farm (National Taiwan University) (NTU) and later also with the Da-Yeh University. In the year 2021 now are 20 years

with cooperation and study the Insect fauna of Taiwan and within this long time a lot of papers are published (e. g. BUCHSBAUM & MILLER 2002, BUCHSBAUM & CHEN 2013, 2018, BUCHSBAUM et al. 2006, 2018 a, 2018 b, BUCHSBAUM & CHEN 2019, CHEN & BUCHSBAUM 2020, BUCHSBAUM & GREHAN 2019).

Taiwan is situated north from The Philippines and south of Japan, east of the PR China. The small island with a size of about 36.179 sqkm is with about 2/3 mountains higher than 1500 m a.s.l. and reach 3952 m a.s.l. with the Mount Jade the highest point. 200 peaks are higher than 3000 m a.s.l. Taiwan is on the border of the Palearctic and Oriental biogeographically regions which makes Taiwan to one of those biodiversity hot spots and it is also very rich in endemic species (MYERS et al. 2000, BROOKS et al. 2002, TURNER et al. 2001, OLSEN & DIRENSTEIN 2002, KIER et al. 2009, SCHINTLMEISTER 2003, REICHOLF 2003, BUCHSBAUM & CHEN 2019, BUCHSBAUM et al. 2020, HOLT et al. 2012, RUEDA et al. 2013, CHEN 2009).

In the mountain above about 1500 m a.s.l. the Insect fauna inhabitants Palearctic fauna elements while in the lower areas an in the southern parts subtropical and tropical fauna elements exists (BUCHSBAUM et al. 2006, BUCHSBAUM et al. 2018, GREHAN et al. 2019, CHEN et al. 2013).

Pseudoips Hübner, 1822

The genus was erected by HÜBNER (1822) with the species *P. prasinana* (Linnaeus, 1758) and contains five species: *P. amarilla* (Draudt, 1950), *P. erenkophila* (Bryk, 1942), *P. nereida* (Draudt, 1959), *P. prasinana* (Linnaeus, 1758) and *P. sylpha*. All occur in the palearctic Region (KONONENKO 2010, FIBIGER et al. 2009, EBERT 1997). FIBIGER et al. (2009) listed the genus *Hylophila* Hübner, 1825 as a Synonym of *Pseudoips*. It cannot be ruled out that there are other species in tropical areas belong to the genus *Pseudoips*. However, this possibility cannot be considered here in the Taiwan-related work.

¹ Contribution to the moths of Taiwan 17: CHEN, M.-Y. & U. BUCHSBAUM (2020): *Hyblaia meifenga* sp. n., a new Hyblaeidae species from the high mountains of Taiwan (Insecta: Lepidoptera). – Mitteilungen der Münchner Entomologischen Gesellschaft **110**: 119–124.

Larvae from most of the species feed on *Fagus* spec., *Betula* spec. and *Quercus* spec. (KONONENKO 2010, FIBIGER et al. 2009, EBERT 1997)

Material, Methods and Locality

The material was collected with a 250 W mixed lamp from about 7:00 pm to around midnight. The specimens were collected with poison glasses and after died was pinned and stored in boxed for transport. Preparation was done with the standard methods on wood spreading boards. Genitalia preparation follows the standard methods after ROBINSON (1976) with the 10% KOH and the genitalia were finally mounted with Euparal. Pictures were done with Olympus Tough TG-5 and genitalia slides was scanned with Nikon supercoolscan 3000 and managed for publication with Adobe Photoshop (personal license). The distribution map was created with mapcreator (personal license).

Pseudoips taiwana sp. n. (Fig. 1–6)

Holotype: ♂: (as on label):

T A I W A N, Nantou Co.; Tunyuan, ca. 1620 m NN; 24.036626N; 121.209657E; LF, 12. September 2015; leg. Ding-Jia Chen

(Additional label in chinese language)

Holotype in Collection D.-J. Chen, Taichung (Taiwan, R.O.C.), later to deposited in National Museum of Natural Science Taichung (NMNS).

Paratypes 1 ♂

T A I W A N, Nantou Co.; Tunyuan, ca. 1620 m NN; 24.036626N, 121.209657E; LF, 04. June 2015; leg. Ding-Jia Chen

(Additional label in Chinese language)

Paratypes 2 ♂, 2 ♀

T A I W A N, Nantou Co.; Tunyuan, ca. 1620 m NN; 24.036626N, 121.209657E; LF, 12. September 2015; leg. Ding-Jia Chen

(Additional label in Chinese language)

Paratypes in Collection D.-J. Chen, Taichung (Taiwan, R.O.C.)

Description and differential diagnoses:

♂ wingspan 31–34 mm, Ø: 32,2 mm, right forewing length: 15–17 mm, Ø: 16,2 mm

♀ wingspan 37–38 mm, Ø: 37,5 mm, right forewing length: 18,5–19 mm, Ø 18,75 mm.

Head and thorax pale green. Abdomen pale yellowish green, lighter in *P. sylpha*. Antenna reddish, *P. sylpha* darker reddish. Labial palps 1/3 longer than eye diameter, in *P. taiwana* slightly slimmer, blunt tipped, in *P. sylpha* stronger with shepherd tip. Forewings ground colour light whitish green, on costa reddish. *P. sylpha* more intensively green on forewings, costa yellowish, pale red. From near apex at costa to dorsum ear base two dark green lines diagonal, nearly parallel to dorsum flattening, white bordered and to dorsum tapering closer to each other. The two lines are wider diverging at dorsal margin in *P. sylpha*. The inner line closer to base than in *P. taiwana*. *P. prasinana* with three lines, one of them from tornus to exactly the apex as in *P. nereida*. At base more intensely green colored, in *P. sylpha* the more intensely green colored part larger.

Hindwings transparent white, in *P. sylpha* transparent white, pale yellowish shining.

Male genitalia (HT): Uncus slim, with long pointed tip, In *P. sylpha* wider, shorter than in *P. taiwana* and in *P. prasinana* shorter and stronger sclerotized. Valvae rounded, corona with less short hairs, *P. sylpha* wider, rounder, hairier. Vinculum flat, pointed, wide, in *P. sylpha* smaller, narrow, in *P. prasinana* longer, less sclerotized. Hairbrush from sacculus long and thin, in *P. sylpha* stronger and much hairier. Aedoeagus short, stout, less sclerotized, with one long thin cornutus, in *P. sylpha* shorter, stronger sclerotized, rounded, cornuti shorter, stronger sclerotized and in *P. prasinana* short, rounded, cornuti wide, shorter, strongly sclerotized and in *P. prasinana* shorter.

Female genitalia (PT): Papillae anales rounded, weakly hairy. Apophyses posteriores slim and long. In *P. sylpha* shorter. Ductus bursae short, stout, less sclerotized., in *P. sylpha* slimmer. Bursa copulatrix oval, in *P. sylpha* larger and more rounded. Signum close ductus bursae wedge-shaped in *P. sylpha* larger, stronger sclerotized. Ductus seminalis rises from end of the anterior corpus, slim long. In *P. sylpha* ductus seminalis rises closer from ductus bursae, longer, stronger, more sclerotized. In *P. prasinana* very short, wider and rise from close ductus bursae. Furthermore, the similar species are compared and described in table 1. These are *P. sylpha*, *P. prasinana* and *P. nereida*.



Fig. 1: *Pseudoips taiwana* sp. n. ♂ Holotype.



Fig. 2: *Pseudoips taiwana* sp. n. ♂ Holotype underside.



Fig. 3: *Pseudoips taiwana* sp. n. ♂ Holotype genitalia,.



Fig. 4: *Pseudoips taiwana* sp. n. ♂ Holotype palps.



Fig. 5: *Pseudoips taiwana* sp. n. ♀ Paratype.



Fig. 6: *Pseudoips taiwana* sp. n. ♀ Paratype underside.

Etymology: The new species is called *P. taiwana* because it was collected in Taiwan. Taiwan which is also known as Formosa, the older name, and now also called Republic of China, because it is a democratic state.

Biology, distribution, life history and foodplants are unknown. Surrounded at the collection site are forests with Oak trees (*Quercus* spec.). Most of them are large, old trees

Table 1: differences in characteristics and distribution to the nearest similar *Pseudoips* spec. moths

species characteristics	<i>Pseudoips taiwana</i> sp. n.	<i>P. sylpha</i>	<i>P. prasinana</i> (after: FIBIGER et al. 2009)	<i>P. nereida</i> (after DRAUT 1950)
Head, thorax, labial palps, antenna	Pale green, labialpalps 1/3 longer than eye diameter, slim, blunt tipped Antenna reddish.	Antenna darker reddish. Labial palps stronger and shepherd	Antenna reddish, labialpalps red,	Head and thorax pale green. Palps white, metathorax white
Body / Abdomen	Pale yellowish green	Lighter yellowish green	thorax green, abdomen light green	Abdomen pale green
Forewings	groundcolour light whitish green, on costa reddish	stronger green on forewings, costa yellowish, pale red	Groundcolour green, male with reddish fringes, female light green	Bright green, marginally light yellow, subterminally whitish
Hindwings	Transparent white	Transparent white, pale yellowish shining	Greenish yellow	Transparent silky shiny white with yellowgreen veins
Male genitalia	Uncus slim, long, with pointed tip, inculum flat pointed, wide	Uncus wider, shorter than in <i>P. taiwana</i> , Vinculum smaller, narrow	Pseudouncus triangular, higher than wider, with pointed tip, Vinculum longer, less sclerotized	Not available
Female genitalia	Papillae anales rounded, weakly hairy. Apophyses posteriores slim and long, ductus bursae short, stout, less sclerotized, Bursa copulatrix oval, Vinculum flat, poited, wide	Papillae anales shorter, apophyses posteriors slimmer, bursa copulatrix larger, more rounded, Vinculum smaller, narrow	Ovipositor short, very wide, longest dorsally, posterior apophyses 1,5 times longer than ovipositor, corpus bursae short, wider, rising close to ductus bursae	Not available
distribution	Endemic in Taiwan	Japan, Russian Far East, China and Korea	Transpalaeartic from Portugal to Japan	Japan, Korea and Russian Far East

Discussion

Pseudoips sylphina Sugi, 1992 is listed as a from Taiwan recorded species (HEPPNER & INOUE 1992), but was never published as new species. The authors suspect that SUGI (1992) gave the specimens a name because he wanted to describe the species. However, there is no evidence of specimens designated as types. No photos, no receipts and no notes (HEPPNER in lit.). This species is listed as nom. nud. in HEPPNER (2012). Also, it is not known from which locality SUGI had specimens from this suggested new species.

The here described new species is only known from the type locality in Nantou County and is as far as known endemic on Taiwan. *P. sylpha* is recorded from Japan, Far East Russia, PR of China and Korea. *P. prasinana* is distributed all over the palaeartic region to East Palaeartic and *P. nereida* is known from Japan, Korea

and Russia Far East, with the type locality Tai-pei-shan from China (INOUE et al. 1982, DRAUDT 1950, FIBIGER et al. 2009, KONONENKO 2010).

Two-thirds of Taiwan consists of mountains over 1500 m above sea level. Many Palearctic faunal elements are represented in this area (e. g. BUCHSBAUM et al. 2006, CHEN et al. 2013, BUCHSBAUM et al. 2018, CHEN & BUCHSBAUM 2020). Species of the genus *Pseudoips* (*P. sylva*, *P. prasinana* and *P. nereida*) are also predominantly distributed in the Palaeartic region (e. g. FIBIGER et al. 2009, KONONENKO 2010, KONONENKO et al. 1998, RYBALKIN et al. 2019).

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Fig. 7 (links): *Pseudoips taiwana* sp. n. ♀ Paratype genitalia.



Fig. 8 (unten): *Pseudoips taiwana* sp. n. ♀ Paratype palps.



Fig. 9: Biotope on type locality collection site (Photo: U. Buchsbaum).



Fig 10: Collection place with light trap (Photo: U. Buchsbaum).



Fig 11: Map with type locality

look and check for specimens of this species and further help with information to this new species. Further but not at least many thanks to John Heppner for his help with the information about the not described species from S. Sugi. Thanks to Dr. Wolfgang Speidel for his comments and discussion about the manuscript.

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