

<https://doi.org/10.70590/ice.2025.01.83>
<http://zoobank.org/urn:lsid:zoobank.org:pub:DBE3B30E-6A65-4EB8-84A4-478AAFC9F3B7>

● A new subspecies of *Timelaea albescens* (Oberthür, 1886) from Yunnan, China (Lepidoptera: Nymphalidae)

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Abstract: A new subspecies of *Timelaea albescens* (Oberthür, 1886), namely *T. a. extensa* Li & Wu **ssp. nov.**, is described from N.W. Yunnan of China, characterized by its well extensive white markings on the hindwing. The images of adults and genitalia, the diagnosis of this new subspecies, along with a distributional map and phylogenetic tree based on the *COI* barcode sequences of this species, are provided.

Keywords: Apaturinae, genitalia, new subspecies, phylogeny

● 中国云南白裳猫蛱蝶一新亚种（鳞翅目：蛱蝶科）

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摘要: 本文描述了产自中国云南西北部白裳猫蛱蝶的一新亚种, 即云南亚种 *Timelaea albescens extensa* Li & Wu **ssp. nov.**, 其特征为后翅更宽阔的白斑。文中提供了该新亚种成虫, 外生殖器图像和鉴别特征, 以及该物种的分布图和基于 *COI* 条形码的系统发育树。

关键词: 闪蛱蝶亚科, 外生殖器, 新亚洲, 系统发育

Citation: Li H-Z & Wu Z-J 2025: A new subspecies of *Timelaea albescens* (Oberthür, 1886) from Yunnan, China (Lepidoptera: Nymphalidae). *The Indochina Entomologist*, 1 (83): 829–837. [李华钊 & 吴振军 2025: 中国云南白裳猫蛱蝶一新亚种（鳞翅目：蛱蝶科）。*中南半岛昆虫学家*, 1 (83): 829–837.]
<https://doi.org/10.70590/ice.2025.01.83>

Accepted by Cheng-Bin WANG: 19.XI.2025; published online: 20.XI.2025

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● Introduction

The genus *Timelaea* Lucas, 1883 (TS: *Melitaea* (?) *maculata* Bremer & Grey, [1853]) is a small but superficially distinctive group endemic to China, currently comprising only two species (Hemming 1967; Masui *et al.* 2011; Masui 2025). Owing to their leopard-like wing patterns, species of this genus were originally placed in Argynninae or Nymphalinae, and the genus was historically regarded as closely allied to *Melitaea* Fabricius, 1807, from which the name *Timelaea* was derived as an anagram (Lucas 1866; Snellen 1892; Bridges 1988; Masui & Inomata 1992). Shirôzu (1960) was the first to correctly transfer the genus to Apaturinae based on genital structures—the extremely long phallus and saccus—an assignment corroborated by current molecular evidence (Zhang *et al.* 2007; Ohshima *et al.* 2010).

T. albescens Oberthür, 1886 was originally described as a variety of *T. maculata*, but subsequently elevated to species rank by Leech (1892–1894), who also provided detailed diagnostic differences between the two species. Later examinations on male genitalia and sympatric distribution further supported the validity of *albescens* as a distinct species with two subspecies, i.e., ssp. *albescens* from Chinese Mainland and ssp. *formosana* Fruhstorfer, 1908 from Taiwan Island (Okano & Okano 1984; Masui & Inomata 1992). However, both Hall (1935) and D’Abrera (1992) found that the population of *T. albescens* from Yunnan shows more extended white markings on the hindwing, which differs conspicuously from previously known subspecies.

Therefore, based on more material, the present study aims to examine the population of *T. albescens* from N.W. Yunnan and to describe it as a new taxon.

● Material and methods

A series of *Timelaea albescens* were examined and some were dissected (Collection of H-Z Li, CHZL; Collection of Z-J Wu, CZJW; Collection of C Chen, CCC; Collection of H-L Hu, CHLH; Collection of J Li, CJL; Collection of C-J Chang, CCJC). Besides, all currently accepted subspecies were also analyzed by examining illustrations given in previous works, including (1) ssp. *albescens* figured in Leech (1892–1894), Seitz (1908), Hall (1935), D’Abrera (1992), Masui & Inomata (1992), Chou (1994), Yoshino (1998), Chen & Jia (2008), Jiang *et al.* (2001), Masui *et al.* (2011), Lang (2012), Yuan *et al.* (2015), Chen (2016), Lo (2017), Wu (2017), Zhu *et al.* (2017), Ma *et al.* (2024), and Masui (2025); (2) ssp. *formosana* figure in Shirôzu (1960), Okano & Okano (1984), D’Abrera (1985), Lee & Zhu (1992), Masui & Inomata (1992), Chou (1994), Masui *et al.* (2011), Lu & Chen (2014), Wu (2017), Hsu *et al.* (2021), and Masui (2025). All the above literature serves as sources of distributional data, with some additional records from iNaturalist (www.inaturalist.org).

The dates on publications of Bremer & Grey (1853) are demonstrated by Griffin (1936a) and thus, the date of *maculata* is given as [1853], rather than [1852] cited by Hemming (1967) and others (Recommendation 22A of ICZN 3rd Edition). Meanwhile, the dates on publications of “Die Grossschmetterlinge der Erde”, including the works of Seitz (1908) and Fruhstorfer (1912), are demonstrated by Griffin (1936b). Terminology for genitalia follows Klots (1970).

Mitochondrial *COI* barcode regions were chosen for phylogenetic analysis. DNA extraction, primers used, and the processes of phylogenetic analyses are identical to the previous work of senior author (Li *et al.* 2025). The accession numbers of specimens used in the molecular analysis were listed in Fig. 5.

● Results

In mainland China, *Timelaea albescens* exhibits phenotypic variation, ranging from the reduced white marking f. *orientalis* Belter, 1942 to the well-marked f. *albescens* with intermediate phenotypes found (Fig. 1). The taxon *orientalis* was originally described as subspecies from Zhejiang, characterized by the white patches on the hindwing smaller and tinged with fulvous (Belter 1942). Recently, this taxon is re-evaluated and treated as a distinct subspecies

by Masui (2025). However, based on the examined material, *orientalis* and *albescens* are sympatric. For instance, the specimen from Sichuan figured in D’Abrera (1992) as *albescens* is actually indistinguishable from *orientalis*. Furthermore, although Masui (2025) regarded the Fujian population as ssp. *albescens*, some individuals from Zhejiang display wing makings identical to those of the Fujian population and also sympatric with typical *orientalis* (W Wang pers. comm.). Our molecular analyses revealed no significant *COI* barcode divergence between the two taxa (Fig. 5). Therefore, considering their sympatric distribution, the presence of intermediate individuals, and the molecular evidence, we support the treatment of *orientalis* as a synonym of *albescens*, leaving it as an infrasubspecific form. It is noteworthy that the frequencies of the two phenotypes vary geographically, with f. *albescens* more prevalent in Sichuan, whereas f. *orientalis* predominates in C. to E. China. Besides, the population from S. China tends to be darker and often hypermelanistic (Hall 1935; Yoshino 1998; Yuan *et al.* 2015). The oldest available name for this phenotype is *obscurior* Hall, 1935 from Guangdong, with *longshengensis* Yoshino, 1998 from nearby Guangxi clearly representing its junior synonym. Currently, taxon *obscurior* is usually listed also as a synonym of ssp. *albescens*, although its potential subspecific status warrants further study (Lang 2012; Masui *et al.* 2011; Masui 2025).

The Taiwanese ssp. *formosana* is similar to the continental subspecies and has similar variations, from the reduced white marking f. *formosana* to the more developed f. *muliebris* Fruhstorfer, 1912. It can be separated from the nominal subspecies by the more prominent basal spot in the forewing cell, a slightly broader white area on hindwing, etc. (Okano & Okano 1984; Lang 2012; Masui *et al.* 2011).

In addition to the two subspecies of *Timelaea albescens*, two new species of *Timelaea* were described in Chou (1994), namely *T. aformis* Chou, 1994 and *T. radiata* Chou & Wang, 1994. Shortly afterwards, Koiwaya (1995) questioned the validity of these two taxa and treated both as aberrations of *T. maculata*. Lang (2012) partly agreed with Koiwaya (1995), but considered *T. aformis* as an aberration of *T. albescens*. In contrast, Masui *et al.* (2011) regarded both taxa as synonyms of *T. albescens*, a treatment followed by Masui (2025) himself and Hsu *et al.* (2021). Clearly, all subsequent studies, with the exception of Chou (1998), treated *T. aformis* and *T. radiata* merely as aberrations, although their senior synonym assignments vary among authors. Based on the absence of the basal spot on the forewing, we follow Masui *et al.* (2011) in treating both taxa as synonyms of *T. albescens* and provide

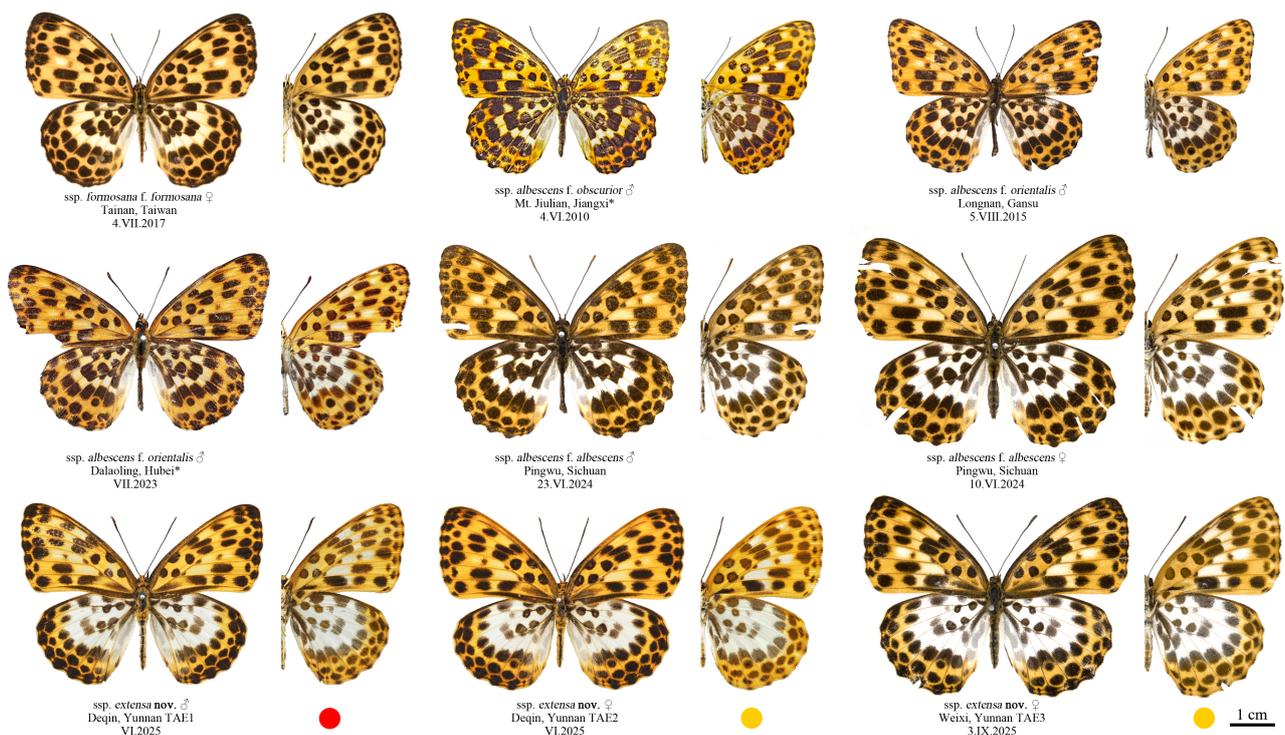


FIGURE 1. Habitus of all subspecies of *Timelaea albescens*. * = not to scale.

specimen photos from or near the type localities of the two so-called new species described in Chou (1994) (Fig. 1).

Last but not least, regarding the population from Yunnan, D’Abrera (1992) noted that it displays a greater extent of white markings on hindwing but classified it as *obscurior*, which is incorrect as *obscurior* is characterized by the rather limited white areas (Fig. 1). In fact, when Hall (1935) described *obscurior* from Guangdong, he compared it with “*albescens*” from TseKou (Cigu/茨古), N.W. Yunnan and concluded that the specimens from Ta-Tsien-lou (Dajianlu/打箭炉, now Kangding/康定), W. Sichuan are intermediate between *obscurior* and *albescens*. Hall’s finding is consistent with our observations: white markings are most extensive in specimens from N.W. Yunnan, less developed in ssp. *albescens* f. *albescens*, reduced and tinged with fulvous in ssp. *albescens* f. *orientalis* and rather restricted in ssp. *albescens* f. *obscurior*, which also exhibits darker pigmentation as stated above (Fig. 1).

Although the focal population cannot be distinguished from the nominal subspecies in the *COI* barcode-based phylogeny, we propose recognizing it as a new subspecies for two primary reasons: (1) its extensive white markings are a unique and consistent morphological trait not found in any other population; and (2) the failure of barcode sequences to recover monophyly at the subspecies or even species level is observed in another genus within the same subfamily (unpublished data). Therefore, a new subspecies of *Timelaea albescens* is described herein with remarks on the Taiwanese subspecies.

Timelaea albescens extensa Li & Wu ssp. nov. 白裳猫蛱蝶云南亚种

<https://zoobank.org/A40452C0-62E7-4151-B7D6-78BE9293E768>

Figs 1–5

Timelaea albescens: Hall (1935): 226 for note.

Timelaea albescens obscurior: D’Abrera (1992): 318 for note.

Timelaea albescens albescens: Masui (2025): 76, pl. 74 for ♂.

Holotype: 1 ♂: VI.2025, Deqin, Diqing, Yunnan, leg. local collector (TAE1, CZJW).

Paratypes: 2 ♀♀: VI.2025, Deqin, Diqing, Yunnan, leg. local collector (TAE2, CZJW); 3.IX.2025, Xinhua Village, Weideng, Weixi, Diqing, Yunnan, ca. 3000 m, leg. local collector (TAE3, CHZL).

Diagnosis. This new subspecies can be distinguished from the two known subspecies by (Fig. 3): Hindwing basal to postdiscal black spots reduced or obscure, resulting in more extensive white area.

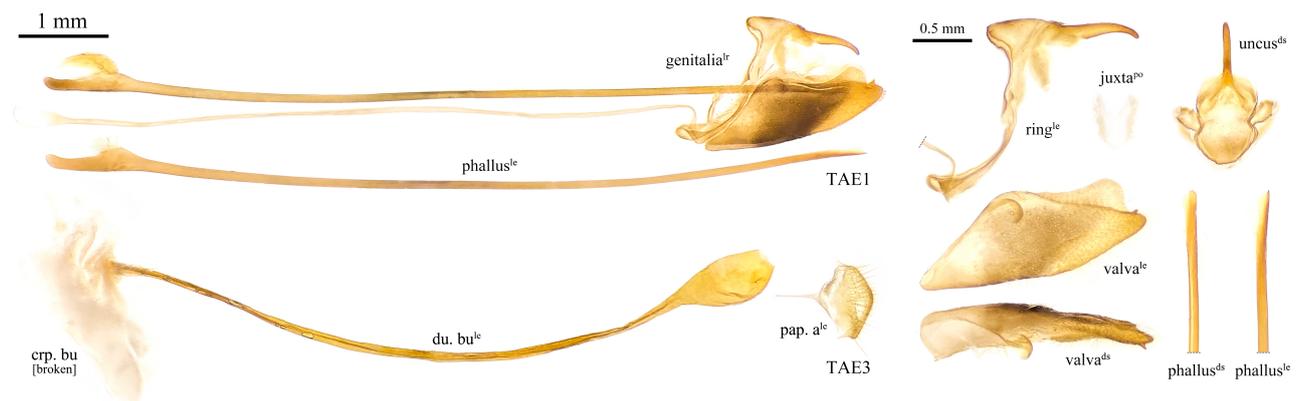


FIGURE 2. Genitalia of *Timelaea albescens extensa* ssp. nov. le/r = lateral left/right view, ds = dorsal view, po = posterior view.

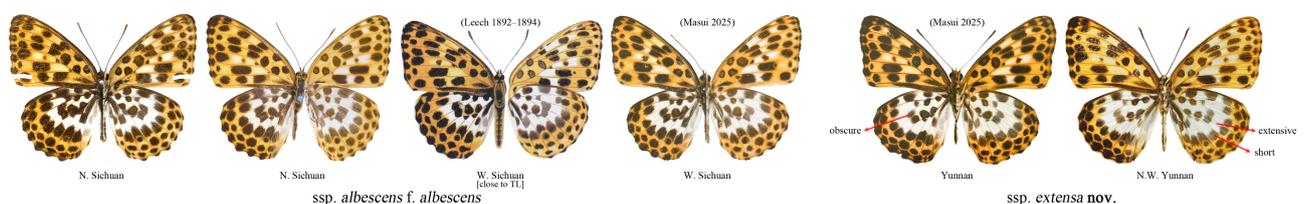


FIGURE 3. Diagnosis of *Timelaea albescens extensa* ssp. nov.

Etymology. The subspecific name refers to the well extensive white markings on the hindwing.

Distribution. N.W. Yunnan, China.

Remarks. Two additional specimens from Yunnan were also examined and with similar appearance, including the one illustrated by Masui (2025), which exhibits the most developed black markings. However, the one in Masui (2025) can still be distinguished from ssp. *albescens* by the reduction of the black spots on the hindwing, particularly the postdiscal ones, resulting in a relatively broader white area (Fig. 3).



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FIGURE 4. Distributional map of *Timelaea albescens*. T and t = TL of subspecies accepted and synonymized respectively. Source from references in Material and methods.

***Timelaea albescens albescens* (Oberthür, 1886) 白裳猫蛱蝶指名亚种**

Figs 1, 3–5

Argynnis maculata var. *albescens* Oberthür, 1886: 18, TL: Chàpa [Shaba/沙坝].

Timelaea albescens: Leech (1892–1894): 246 for comb. nov. et stat. rev.

Timelaea albescens obscurior Hall, 1935: 226 + pl. VI, fig. 4 for ♂, TL: Canton [Guangzhou]. [syn.]

Timelaea albescens orientalis Belter, 1942: 149, TL: West-Tien-Mu-Shan, Chekiang [West Mt. Tianmu, Zhejiang]. [syn.]

Timelaea aformis Chou, 1994 in Chou (1994): 437, fig. for ♂ + 760, fig. 36 for ♀ [rec. ♂], TL: Hubei. [syn. et ab.]

Timelaea radiata Chou & Wang, 1994 in Chou (1994): 437, fig. for ♂ + 760–761, figs 36–37 for ♂ and genitalia, TL: Wenxian. [syn.]

seasonal differentiation of *ssp. formosana* is not evident in the nominal subspecies since all three forms of *ssp. albescens* co-occur during summer (Leech 1892–1894) (Fig. 1). This suggests a more complex mechanism underlying individual variation, likely influenced by climatic factors. Specifically, *ssp. albescens f. albescens* tends to occur in alpine zones, *f. orientalis* in subtropical monsoon regions, and *f. obscurior* extends almost into tropical regions (Zhang 2011). The complexity of these patterns raises the question of whether the new subspecies is monomorphic or exhibits multiple phenotypes, which requires further material to resolve.

● Acknowledgements

We would like to express our sincere gratitude to anonymous Mr. Liu and Mr. Tian Xie (Hefei) for providing important information, making this study possible. In addition, thanks are due to Messrs. Guo-Xi Xue (Zhengzhou), Chuan Chen (Mianyang), Ru-Da Liu (Wuhan), Jian Li (Pingliang), Peng Yu (Chongqing), Chen-Jui Chang (Taichung), Wei Wang (Quzhou) for sending material for comparison. Last but not least, thanks must go to the reviewers and editor for their valuable comments on the manuscript.

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● Additional information

Author contributions: Resources: Z-J Wu and H-Z Li. All others: H-Z Li.

Conflict of interest: The authors have declared that no competing interests exist.

Data availability: All of the data that support the findings of this study are available in the main text.

Ethical statement: No ethical statement was reported.

Funding: This study was self-funded by the authors.

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