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# A new specie of the genus *Phthorarcha* Meyrick, 1892 from Gansu, China (Lepidoptera: Geometridae)

Chunlan Xian, Rui Cheng, Hongxiang Han & Nan Jiang

## Abstract

A new species of the genus *Phthorarcha* Meyrick, 1892 is described from Gansu of China: *Phthorarcha pallidia* Xian & Jiang, sp. nov. Diagnosis of the new species is provided; illustrations of external features and male genitalia of the new species are also presented.

**Keywords:** Lepidoptera, Geometridae, *Phthorarcha*, diagnoses, morphology, taxonomy, China

Una nueva especie del género *Phthorarcha* Meyrick, 1892 de Gansú, China  
(Lepidoptera: Geometridae)

## Resumen

Se describe una nueva especie del género *Phthorarcha* Meyrick, 1892, procedente de Gansú, China: *Phthorarcha pallidia* Xian & Jiang, sp. nov. Se proporciona el diagnóstico de la nueva especie; también se presentan ilustraciones de las características externas y de la genitalia del macho de la nueva especie.

**Palabras clave:** Lepidoptera, Geometridae, *Phthorarcha*, diagnóstico, morfología, taxonomía, China

## Introduction

The genus *Phthorarcha* Meyrick, 1892 is a member of the subfamily Alsophilinae. The species of *Phthorarcha* are active in cold season, and the females are apterous (Kostjuk et al. 2020). Meyrick (1892) established *Phthorarcha* and mentioned *primigena* Staudinger as the type species. Later, Staudinger (1895) described *Anisopteryx primigena* Staudinger, 1895 for the first time. Fletcher (1979) mentioned: “*Phthorarcha* was nomenclatural available from 1892, but the sole species included by Meyrick was a nomen nudum until described by Staudinger in 1895”.

Recently, Kostjuk et al. (2020) reviewed the Central Asian species of *Phthorarcha*, described a new species, *Phthorarcha haberhaueri* Kostjuk, Mironov & Viidalepp, 2020, and gave some diagnoses of the genera *Phthorarcha*, *Alsophiloides* Inoue, 1961 and *Chimaphila* Nakajima & Wang, 2013. Until now, four species have been recognized including one species recorded from China (Prout, 1912-1916; Parsons et al. 1999; Viidalepp, 1986, 1987; Nakajima & Wang, 2013; Kostjuk et al. 2020).

During recent studies in the collection in IZCAS, we have discovered one new species of *Phthorarcha*. The purpose of this paper is to describe a new species of *Phthorarcha* from Gansu of China: *Phthorarcha pallidia* Xian & Jiang sp. n. and provide diagnostic characters of the new taxa.

## Material and methods

Specimens used in this study are deposited in IZCAS-Institute of Zoology, Chinese Academy of Sciences, Beijing, China. Terminology for wing venation follows the Comstock-Needham System (Comstock, 1918) as adopted for Geometridae by Scoble (1992) and Hausmann (2001); that for genitalia follows Pierce (1914, reprint 1976), Klots (1970), and Nichols (1989). Photographs of moths were taken with a digital camera. Composite images were generated using Auto-Montage software version 5.03.0061 (Synoptics Ltd). The plates were compiled using Adobe Photoshop software 7.0. Ink (Adobe Systems Software Ireland Ltd).

## Taxonomy

### *Phthorarcha pallidia* Xian & Jiang sp. n. (Figures 1-3)

Material examined (IZCAS). Holotype ♂, CHINA: Gansu, Lanzhou, yuzhongxian, xinglongshan, 2200 m, 13-IV-2005, coll. Wang Xuejian. Paratypes: Gansu, 16 ♂♂, same data as holotype.

Description: Male adult (Figure 1). Antennae dentate with very long fascicles of cilia, length of bristles more than three times of diameter of shaft. Frons grey. Labial palpus very small, not extending beyond frons. Tongue obsolete. Vertex, dorsal side of thorax and abdomen dark grey. Hind tibia without medial spurs. Forewing length: male 16-18 mm. Forewing slender, slightly pointed at apex, outer margin smooth; hindwing slender with apex rounded. Wings ground colour pale grey, forewing densely covered with dark greyish brown, hindwing translucent. Forewing with medial and postmedial lines blackish brown, serrate, distinct near costa and anal margin, and often dentate on each vein; blackish brown streak near Sc connected medial line and postmedial line; postmedial line edged with pale grey line outside; a blackish brow streak raising from apex and contacted with postmedial line at  $M_1$ ; a pale patch present inside of apex, extending to inner side of postmedial line and breaking postmedial line in most specimens; marginal line blackish brown, often dot-like at end of each vein; discal spot dark grey; fringes pale grey. Hindwing with discal spot dark grey; marginal line indistinct; fringes pale grey. Underside grey, discal spot of both wings blackish grey; postmedial line forming a blackish grey patch on costa.

Venation. Forewing:  $R_1$  shortly anastomosed with Sc and two accessory cells between radial veins or sometimes  $R_1$  free and one accessory cell between radial veins;  $R_2$  anastomosed with  $R_1$  and  $R_{3,4}$ ;  $R_5$  rising after  $R_3$ , near apex. Hindwing: Sc+R long anastomosed with upper margin of discal cell to near middle of cell; length of discal cell more than two third of maximum length in middle of hindwing; Rs and  $M_1$  rising from apical of discal cell or shortly stalked;  $M_2$  weak, almost absent.

Male genitalia (Figures 2-3). Uncus triangular with apex slender. Gnathos absent. Valva short with apex almost triangular, rounded at tip; dorsal margin with two processes, basal one narrow and straight, medial one curved outward and slightly longer than basal one; juxta almost Y shaped, semicircle concaved on posterior margin. Saccus almost quadrate terminally with a tongue-like lobe. Aedeagus curved; manica bifurcate with apex tapering.

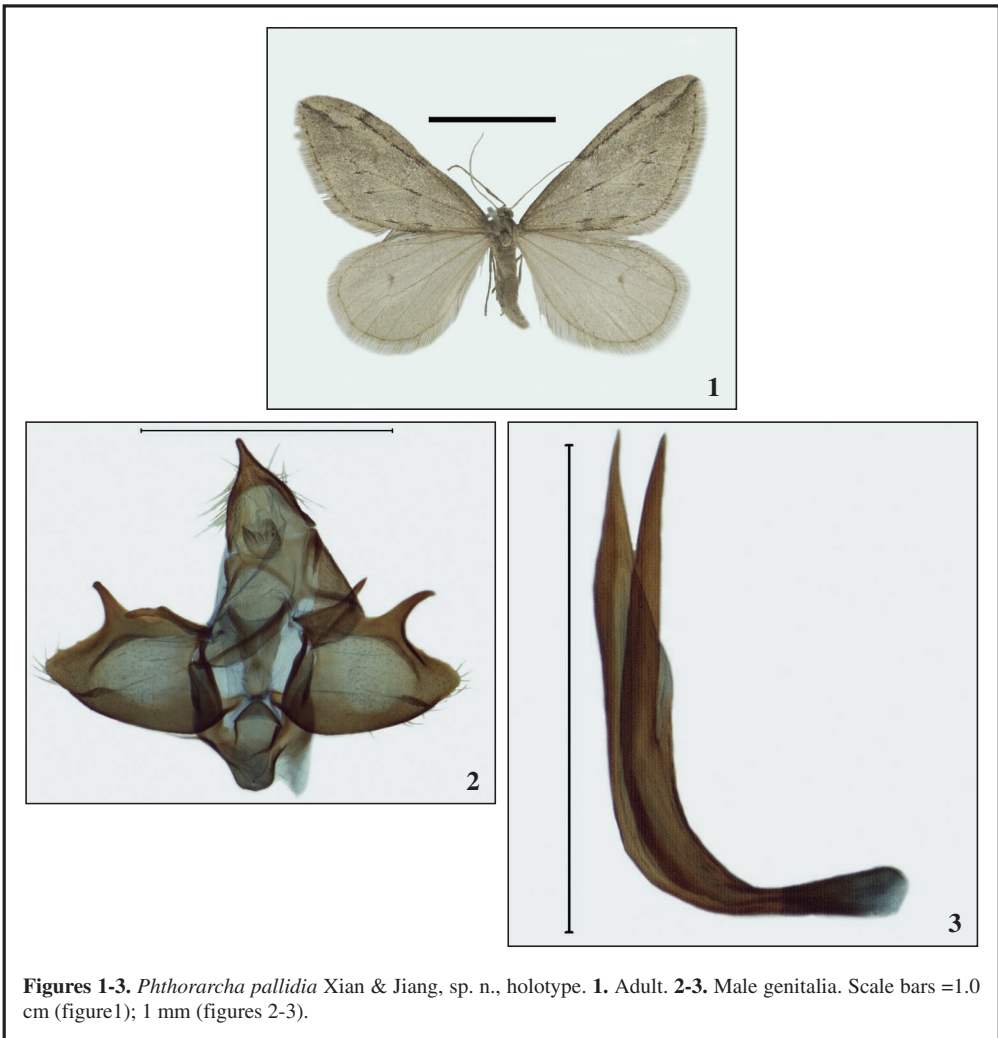
Diagnosis: The species is similar to *Phthorarcha ishkovi* Viidalepp, 1986. However, it can be distinguished from *P. ishkovi* by the following characters: the streak between the apex and the postmedial line of the forewing is straighter; the distance from the medial line to the postmedial line on the costa of the forewing is less than twice the distance from the medial line to the postmedial line on the hind margin, while it is twice as broad on the costa than on the hind margin in *P. ishkovi*; the radian of the anal angle of the forewing is larger; the outer margin of the forewing is more inclined; the streak between the medial line and postmedial line is continuous, while it is broken and indistinct in *P. ishkovi*; the pale patch inside the apex usually extends to inner side of the postmedial line and breaks the postmedial line, while it rarely extends to inner side of the postmedial line and breaks the postmedial line in *P. ishkovi*; the marginal dots of the forewing are more indistinct. In the male genitalia, the apex of the uncus is slenderer; the apex of the valva is much narrower; the medial process on the dorsal margin of the valva is much slenderer and longer; the apex of the saccus is almost quadrate, while it is rounded in *P. ishkovi*.

Distribution: China (Gansu).

Etymology: The specific name is based on the Latin word *pallidius*, referring to the pale apex of the forewing.

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**Figures 1-3.** *Phthorarcha pallidia* Xian & Jiang, sp. n., holotype. **1.** Adult. **2-3.** Male genitalia. Scale bars =1.0 cm (figure1); 1 mm (figures 2-3).

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