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Research Article

A newly recorded genus of Noctuoidea (Lepidoptera: Noctuidae, Xyleninae, Cosmiina) from Xizang, China

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Abstract

A new record genus for Xizang, the genus *Ipimorpha* Hübner, [1821] 1816, was discovered during a survey of the Lahu Wetland in Lhasa in 2021. This genus which has only two species in China including *Ipimorpha retusa* (Linnaeus, 1761) and *Ipimorpha subtusa* ([Denis & Schiffermüller], 1775), was first reported in Xizang. A detailed description of the adult morphology and external genitalia is given, together with pictures of the adults, photographs of the external genitalia, and information on their distribution in China and abroad. The specimens are preserved at the Institute of Plateau Ecology, Tibet Agricultural and Animal Husbandry University.

Introduction

Ipimorpha Hübner, [1821] belongs to the Lepidoptera, family of Noctuidae and subfamily of Xyleninae, tribus Xylenini, subtribus Cosmiina, and has only eight species worldwide, which includes *I. contusa* (Freyer, 1849); *I. retusa* (Linnaeus, 1761); *I. subtusa* ([Denis & Schiffermüller], 1775); *I. guanyuana* Chang, 1991; *I. nanaimo* Barnes, 1905; *I. viridipallida* Barnes & McDunnough, 1916; *I. pleonectusa* Grote, 1873 with subspecies *I. pleonectusa manitobae* McDunnough, 1938; *I. subvexa* Grote, 1876; and *I. intexta* Harvey, 1875. They are found mainly in Europe, Asia, and North America [1,2]. *Ipimorpha subtusa* and *I. retusa* are widely distributed [3-7], covering most area of Europe and Asia. The two species were first found in the southwestern region of China in 2011 [3-6]. In this paper, *I. subtusa* and *I. retusa* were collected in August 2021 from Lhalu Wetland, a typical high plateau city wetland with an altitude of 3645m, located in Lhasa, Xizang, China, are found to be distributed in Xizang for the first time, which is

of reference significance for biological invasion and wetland conservation.

Material and methods

Abbreviations of the depositories used: TAAHU= Tibet Agricultural and Animal Husbandry University (Linzhi, China).

Dissected genitalia in anhydrous ethanol were photographed after pressing and embedded in glycerol for preservation. The photographs of adults were taken using a Canon EOS 5D Mark III camera equipped with Canon EF 100 mm f / 2.8L Macro USM lens. The genitalia were imaged using a Leica EZ24D microscope attached to the imaging system. All photographs were processed using the Adobe Photoshop CC 2019 software.

The male and female genitalia terminology follows the standard from ÁDÁM KISS [8] and Kononenko [9].

For *Ipimorpha retusa* (Linnaeus, 1761) and *Ipimorpha subtusa* ([Denis & Schiffermüller], 1775, we use pictures from



Kononenko book: Kononenko, V.S. [7] Noctuidae: Cuculliinae – Noctuinae, part (Lepidoptera). – *Noctuoidea Sibiricae*. Part 3. Proceedings of the Museum Witt Munich 5: 1-497 [3], Munich – Vilnius. We copied the pictures from the book and include them in our publication (Figures 3,6,7,14,15,18,19).

Taxonomy

Ipimorpha Hübner, [1821]

Ipimorpha Hübner, [1821]; Verz. bek. Schmett. (15): 238; TS: *Noctua subtusa* Schiffermüller.

Plastenis Boisduval, 1840; Genera Index Eur. Lepid.: 93; TS: *Noctua subtusa* Schiffermüller.

Ipimorpha retusa (Linnaeus, 1761)

(Figures 1-5,12-14,18,20,21)

Phalaena (Noctua) retusa Linnaeus, 1761; Fauna Suecica (Edn 2): 321; TL: Swe-den.

Phalaena vetula Hübner, 1788; Beitr. Gesch. Schmett. 1 (3): 13; TL: Augsburg re-gion.

Phalaena (Noctua) chrysoglossa Beckwith, 1794; Trans. Linn. Soc. Lond. 2: 6; TL: [England].

Noctua gracilis Haworth, 1809; Lepid. Britannica (2): 251; TL: Great Britain.

Cosmia curvata Butler, 1886; Trans. ent. Soc. Lond. 1886 (2): 131; TL: Japan, Yokohama, Fukushima.

Material (Figures 1, 2, 4, 5, 12, 13, 20, 21). 22 male, Lhalu Wetland, Lhasa, Xizang, 5-9. VII. 2021, H 3650 m, E 91° 6' 33", N 29° 40' 11". 8 female, Lhalu Wetland, Lhasa, Xizang, 5-9. VII. 2021, H 3650 m, E 91° 6' 33", N 29° 40' 11".

Description. Adults (Figures 1-5) Wingspan 30-33mm, Antennae linear, middle part of male antennae unilaterally broadly serrate. The palpus and thorax are slightly brown. The abdomen is dark brown. The forewing is overall tan with



1 *I. retusa* male



2 *I. retusa* male



3 *I. retusa* female IBSS



4 *I. retusa* female



5 *I. retusa* female



6 *I. subtusa* male IBSS

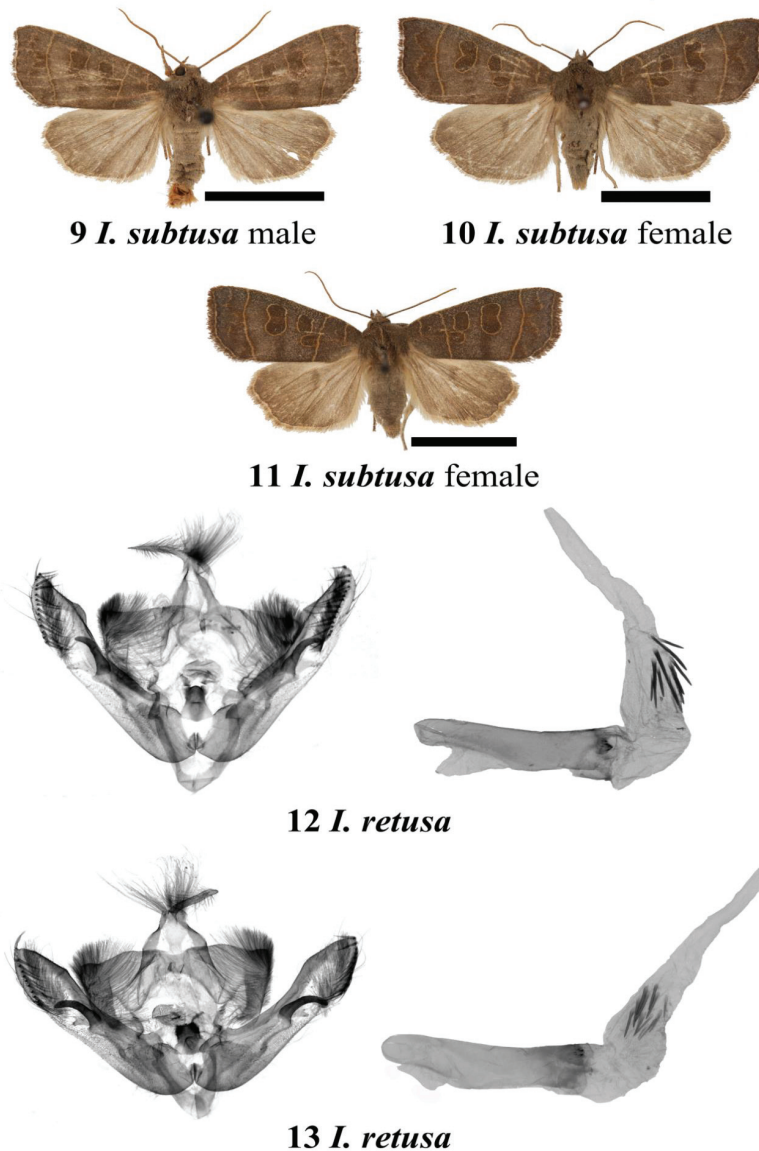


7 *I. subtusa* female IBSS



8 *I. subtusa* male

Figures 1-8: *Ipimorpha* spp.: adults. 1, 2, 4, 5. *I. retusa*. 3. *I. retusa* IBSS. 6, 7. *I. subtusa* IBSS. 8. *I. subtusa*.



Figures 9-13: *Ipimorpha* spp.: adults and male genitalia. 9-11. *I. subtusa*. 12, 13. *I. retusa*.

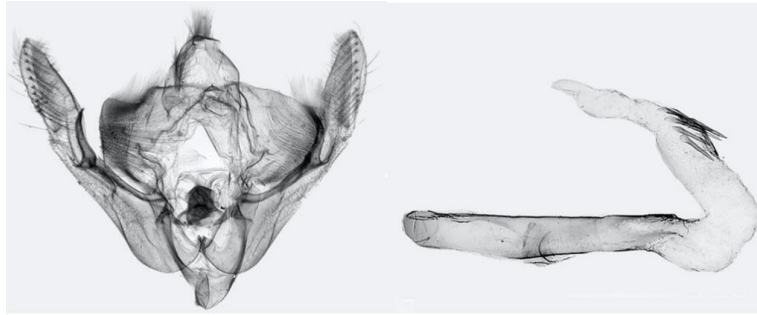
reddish-brown fine dots, slightly narrower in shape, the outer margins of the wings are in an S-shape, and the top corners are pointed; Basal, antemedial, and postmedial lines are in a single line, earthy yellow, flatter postmedial line; Subterminal line single, wavy, lightly earthy yellow; Terminal line yellow; Orbicular pattern slightly oval, anterior end larger than the posterior end, dark brownish, surrounded by hyaline margins; Reniform in the shape of a "B", dark brown, with earthy yellow side surround; Reddish-brown in the subterminal field, grayish-brown in the terminal field; cilia brown. Hindwing light tan, darker in females; Discal spot narrowly crescent-shaped, fuzzy, and dark brown in color; Cilia pale yellowish brown, posterior cilia pale earthy yellow.

Male genitalia (Figures 12-14) Uncus sickle-shaped or curved, narrower, pointed at the end. Tegumen narrow, triangular; peniculus triangular, densely brus; Juxta tabular, rounded at upper end, slightly convex at middle of lower end; Saccus V-shaped; Costa narrow, extending flat and upward,

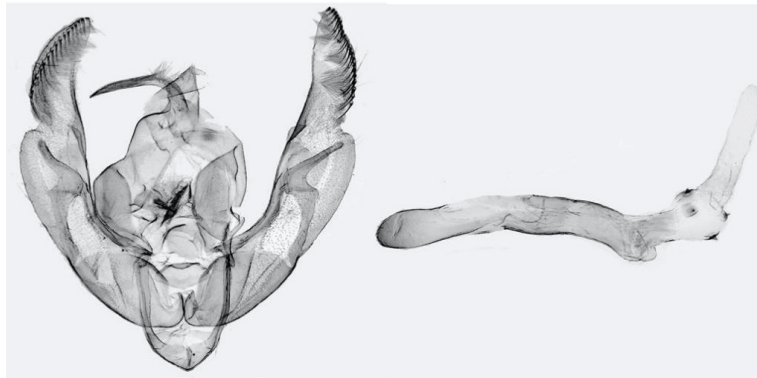
with raised in the end; Cuculus obliquely inwardly sloping, with a neatly arranged row of stout bristles; The sacculus is slightly narrower, and extends gently upward; Harpe finger-like, stout, and slightly curved upward. Digitus angular, extending toward the sacculus margin. Aedeagus terete, Carina short; Ductus ejaculatorius longer; Vesic curved dorsally, membranous, proximal part with a cluster of long cornuti.

Female genitalia (Figures 18,20,21) Papillae analis conical-barrel-shaped, sparsely bristles; Anterior apophysis slightly shorter than posterior apophysis; Antrum with hardened ring; Dorsal plate membranous; Ductus bursae short, slightly sclerotic in the center; Appendix-corporis complex slightly elongated, rounded at the end; Appendix bursae thickly membranous, disk-shaped.

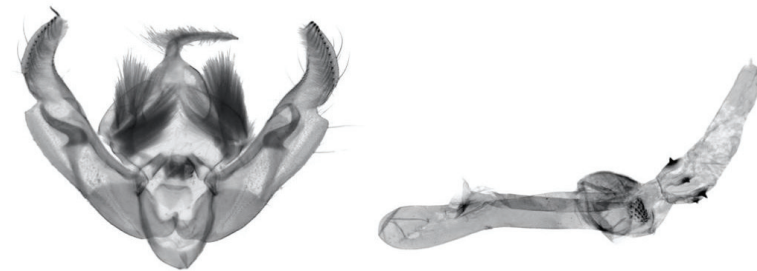
Distribution: China (Xizang, Heilongjiang, Xinjiang, Henan); Europe, Russia, Japan, Korea, North Korea.



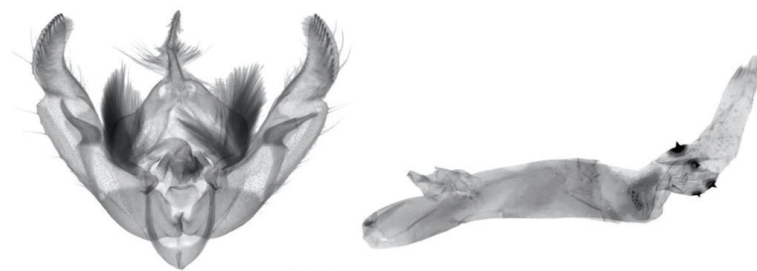
14 *I. retusa* IBSS



15 *I. subtusa* IBSS



16 *I. subtusa*



17 *I. subtusa*

Figures 14-17: *Ipimorpha* spp.: male genitalia. 14. *I. retusa* IBSS. 15. *I. subtusa* IBSS. 16-17. *I. subtusa*.

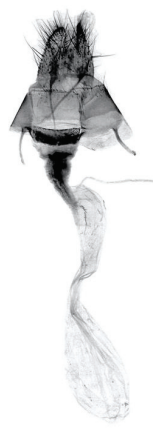
Ipimorpha subtusa (Schifferrmüller, 1775)

(Figures 6-11,15-17,19,22,23)

Noctua subtusa Schifferrmüller, 1775; Ank. syst. Schmett. Wienergegend: 88; TL: Vienna region.

Material (Figures 8-11, 16, 17, 19, 22, 23). 5 male, Lhalu Wetland, Lhasa, Xizang, 5-9. VII. 2021, H 3650 m, E 91° 6' 33", N 29° 40' 11". 3 female, Lhalu Wetland, Lhasa, Xizang, 5-9. VII. 2021, H 3650 m, E 91° 6' 33", N 29° 40' 11".

Description. Adults (Figures 6-11) Wingspan 30 mm - 34 mm. Antenna linear, male antenna thicker. Head and thorax tan, slightly darker; Abdomen lightly brownish. Forewing dark grayish brown overall, slightly narrow; Basal line, antemedial line, and postmedial line are single line, earthy yellow, antemedial line flat and slanting outward; Antemedial line and middle part of cilia slightly protruding, subapical and gluteal angles inwardly sloping; Subterminal line not evident; Orbicular oval-shape, dark brown, earthy yellow side surrounded; Reniform "B"-shaped, dark tan, surrounded

18 *I. retusa* IBSS19 *I. subtusa* IBSS20 *I. retusa*21 *I. retusa*22 *I. subtusa*23 *I. subtusa*

Figures 18-23: *Ipimorpha* spp.: female genitalia. 18. *I. retusa* IBSS. 19. *I. subtusa* IBSS. 20, 21. *I. retusa*. 22, 23. *I. subtusa*.

by a yellowish rim; Claviform slightly semi-elliptic, dark brown, earthy yellow side surrounded; Cilia brownish-brown. Hindwing brown, darkening from basal field to terminal field; Discal spot dark brown spot; Cilia yellow-brown, posterior cilia pale earthy yellow.

Male genitalia (Figures 15-17) Uncus curved, falcate, slightly pointed at the tip, setose. Tegumen slightly inflated, arched; peniculus broad, densely brush; Juxta triangularly vase-shaped, revolute in the middle, extending upward at the upper end, and projecting in the middle of the lower end; Saccus "U"-shaped; Costa of clasp narrow, extending straight upward, with a curved projection on the inner side of the proximal part; Cuculus angular, obliquely inward, corona arranged in neat rows; Sacculus slightly narrower, extending obliquely upward, end slightly wider, concave at intervals with cuculus; Hape angular, stout, thickening by upward extension. Aedeagus terete, slightly curved dorsally, carina with spiny bands; Vesica short, slightly as long as aedeagus, base slightly expanded, bearing 4 cornuti.

Female genitalia (Figures 19,22,23) Papillae analis conical-barrel-shaped, setose; Anterior apophysis is 1/2 posterior apophysis; Antrum with ossified rings; Ductus bursae short,

thickly membranous, tapering downwards; Corpus bursae slightly elongated, membranous, elongated teardrop; Appendix bursae membranous, semicircular in shape.

Distribution: China (Xizang, Guangdong); Europe, Russia, Japan, Korea.

Conclusion

The Lalu Wetland is located in Lhasa, Xizang, hinterland of the Tibetan Plateau, where the unique geography and long-term adaptation to the plateau wetlands have caused *I. retusa* and *I. subtusa* to differ from adults and genitalia elsewhere, but not enough to become new subspecies.

Acknowledgements

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