

***Scotopteryx kuznetzovi* (Wardikian, 1957)
(Lepidoptera, Geometridae, Larentiinae),
a new species for the fauna of Iran and Turkey**

Hossein Rajaei Sh.* & Dieter Stünig

Zoologisches Forschungsmuseum Alexander Koenig, Adenauerallee 160, D-53113 Bonn, Germany

** Corresponding author: rajaei@daad-alumni.de; eagle4261@yahoo.com*

Abstract. *Scotopteryx kuznetzovi* (Wardikian, 1957), a rare and habitually remarkable Larentiine species described from Armenia, is recorded for the first time from Iran and Turkey. Males from both countries are illustrated, the females being still unknown. A redescription is given and diagnostic characters are presented. External features and genitalia are mainly compared with those of *S. vicinaria hyrcanaria* (Staudinger, 1892), described from northern Iran, and other taxa of the *vicinaria* species group which all have genitalia very similar to *S. kuznetzovi*. The taxonomic position of the latter is briefly discussed.

Key words. *Scotopteryx kuznetzovi*, redescription, new records, Iran, Turkey.

INTRODUCTION

Scotopteryx Hübner, 1825, a Larentiine genus belonging to the tribe Xanthorhoini Pierce, 1914, contains more than 70 species which are distributed in the Palaearctic region from Europe to Far East Asia, in South Africa and South America (Parsons et al., 1999). Neither in the latter publication nor in the updated list of the Geometridae of the World (Scoble & Hausmann, 2007) *Scotopteryx kuznetzovi* (Wardikian, 1957) was mentioned. Until now, no further records of this species, which was described on a single male from Armenia, have been published. Here we record the data of five additional males found in the collections of the Zoologisches Forschungsmuseum Alexander Koenig, Bonn (ZFMK, collection Peter Kuhna) and Hayk Mirzayans Insect Museum (HMIM) in the Iranian Research Institute of Plant Protection, Tehran, recently. In addition, we provide a redescription of this almost unknown species and compare it with the probably related taxa of the *S. vicinaria*-group.

TAXONOMY

Redescription of *Scotopteryx kuznetzovi* (Wardikian)

Ortholitha kuznetzovi Wardikian, 1957: 281.

Type Material. Holotype ♂, (collection of the Zoological Institute, Academy of Science of Armenia).

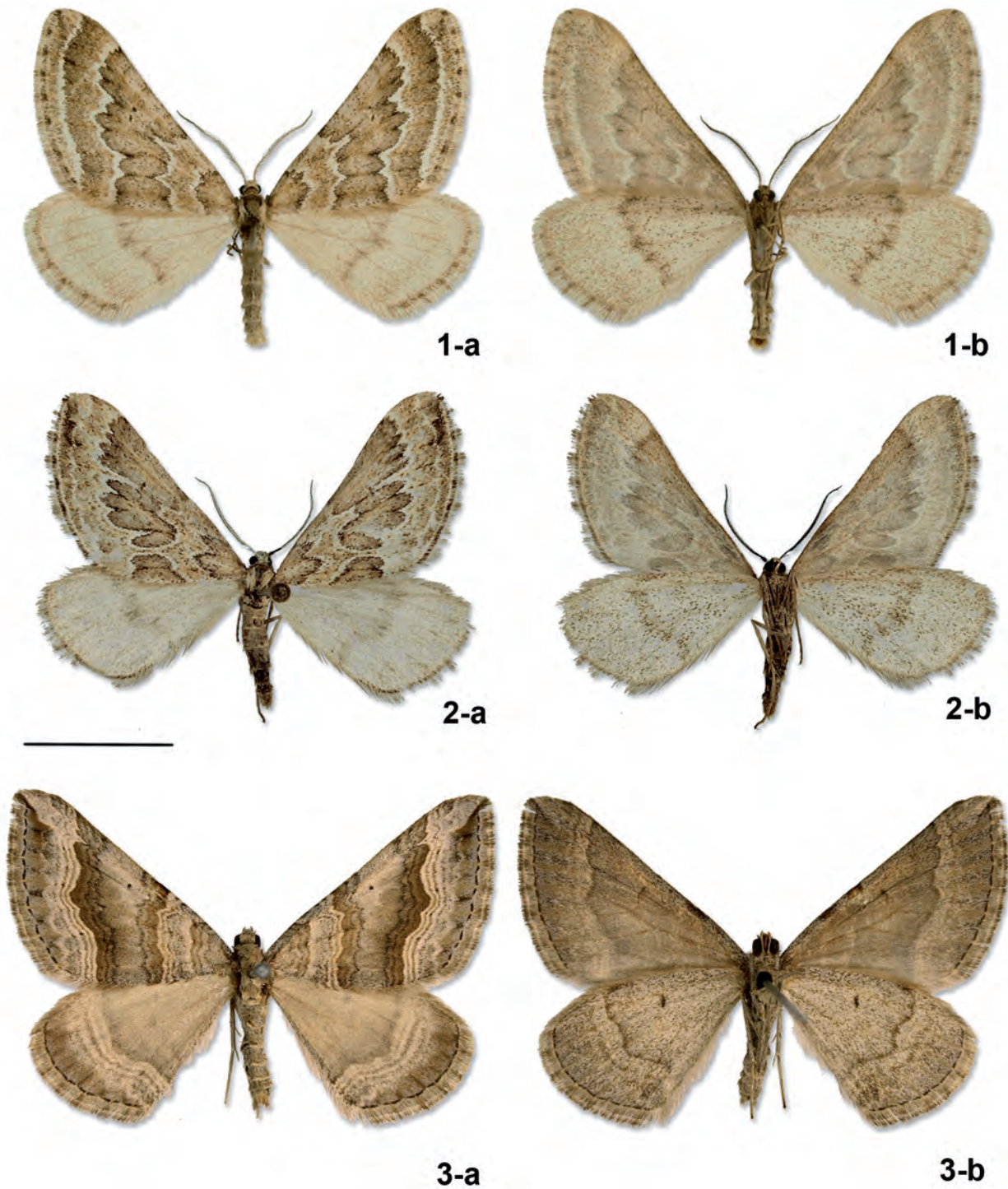
Type locality. Yerevan (Armenia).

Scotopteryx kusnetzovi: Wardikian, 1985: 27, 52 (incorrect subsequent spelling).

Scotopteryx kuznetsovi: Viidalepp, 1996: 13 (incorrect subsequent spelling).

Material examined. 2 ♂: Basmendj [NW Iran, SE Tabriz], 15.10. [19]74, [leg.] Damanabi, gen. preps 1063 & 1064/2010 H. Rajaei, Iran; coll. HMIM. 2 ♂: Ost Türkei, Van, 2700 m, Güzeldere Pass, 28.9.1981, leg. P. Kuhna, gen. prep. 3074, P. Kuhna; 1 ♂: Turkey, Prov. Bitlis, Van Gölü, 19 km E of Ahlat, 1700 m, 42°34' E, 38°46' N, 18.10.1993, leg. Gy. Fábrián, B. Herczig, Gy Laszlo and K. Szeőke, coll. ZFMK.

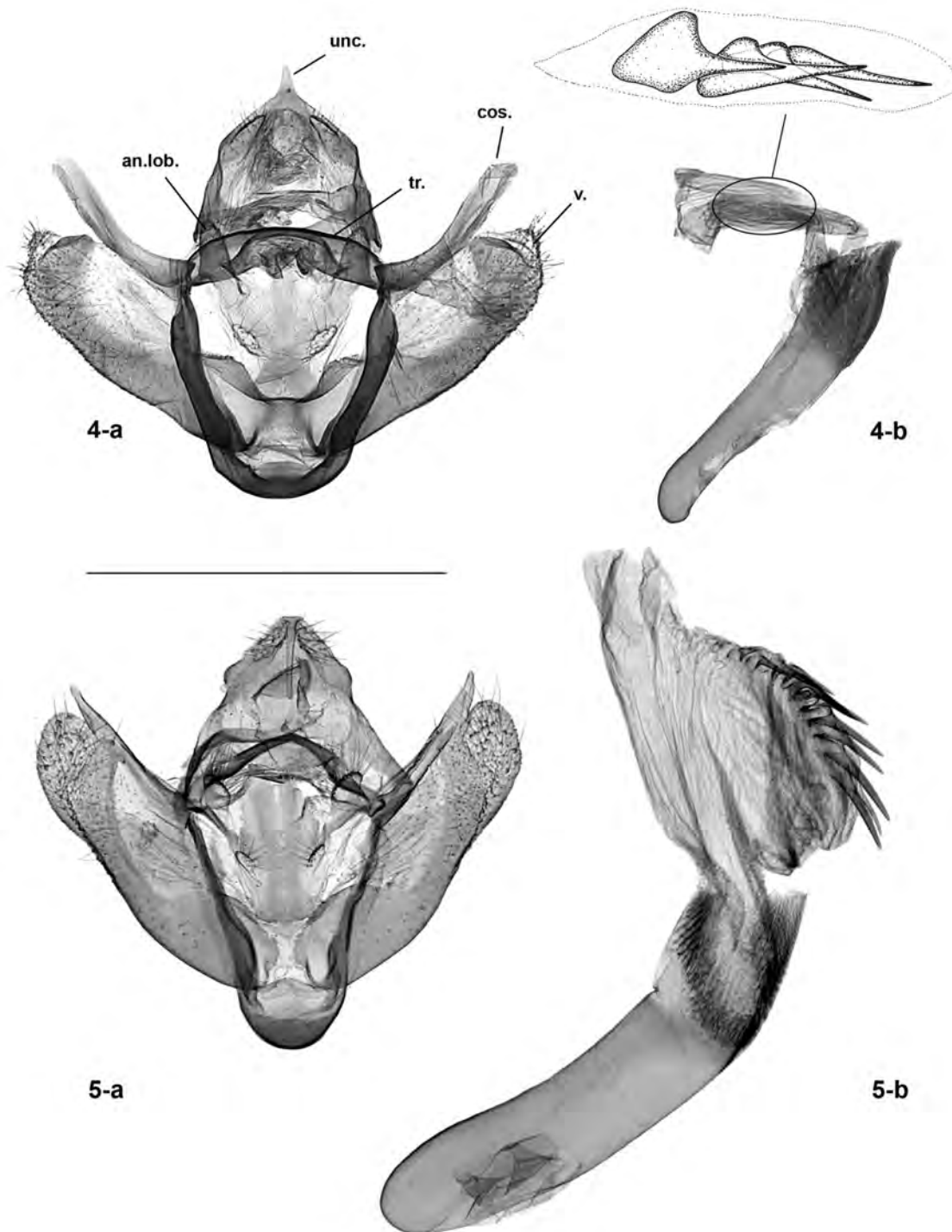
Morphology of adult males (Figs 1, 2). Wingspan 29–30 mm. Antenna bipectinate from base to tip, except 2–3 distal segments, rami moderately long, black, dorsally unscaled, arising ventrally from the proximal end of the flagellum segments, the latter scaled white dorsally. Head, thorax and abdomen covered with mixed greyish-white and greyish-brown scales. Frons broad, roundly protruding, lower part smoothly covered with very small, greyish-brown scales, upper margin a broad band of large, white scales, vertex with large white and brown scales mixed. Chaetosemata transversally extended. Palpi short and narrow, acute at tip, just reaching beyond the clypeus. Haustellum almost completely reduced. Tibia of hindlegs not dilated, index of spurs 0-2-4. Forewings elongated, length 16–18 mm, apex and tornus rounded. Ground colour yellowish-brown, surface shining, basal area and medial band edged with dark brown internally and white externally. Basal line moderately (in Turkish specimens) to strongly (in Armenian and Iranian specimens) indented. Antemedial line roundly curved in the middle, with two acute incisions anteriorly and posteriorly, the latter enlarged and completely dividing the medial band in the



Figs 1–3. Adults (males) of *Scotopteryx*. 1–2. *Scotopteryx kuznetzovi*: 1. Güzeldere Pass, E. Turkey; 2. Basmendj, Iran. 3. *Scotopteryx vicinaria hyrcanaria*, syntype, “Schakuh” [Semnan Prov., NE Iran]; a: dorsal view, b: ventral view. Scale bar: 1 cm.

holotype and in specimens from Iran. Postmedial line wavy, roundly curved outwards in the middle, also with two deep incisions at either side. Submarginal line white, rather smooth in Turkish specimens, wavy in the holotype

and the Iranian material. Apical whitish triangular patch distinct in the holotype, but weakly defined in the other specimens. Fringe consisting of a row of shorter and darker basal scales and a row of longer and lighter terminal



Figs 4–5. Male genitalia. **4.** *S. kuznetzovi* (NW. Iran); **5.** *S. vicinaria hyrcanaria* (Schahkuh); **a.** genital armature, **b.** aedeagus. Abbreviations: unc. Uncus; tr. Transtilla; cos. Costa; v. Valva; an.lob. Anellus lobe. Scale bar: 1 mm.

scales, both with distinctly darker areas near the ends of veins. Discal dots black, narrow streak-like or separated into dots in the forewings, absent in the hindwings. The latter oval, elongated, whitish-grey, with a darker grey me-

dial band. Fringe as in forewings. Underside generally paler, but basal area up to postmedial line darker than the rest, patterns of upper side only partly visible. Underside of hindwing loosely scattered with single dark brown

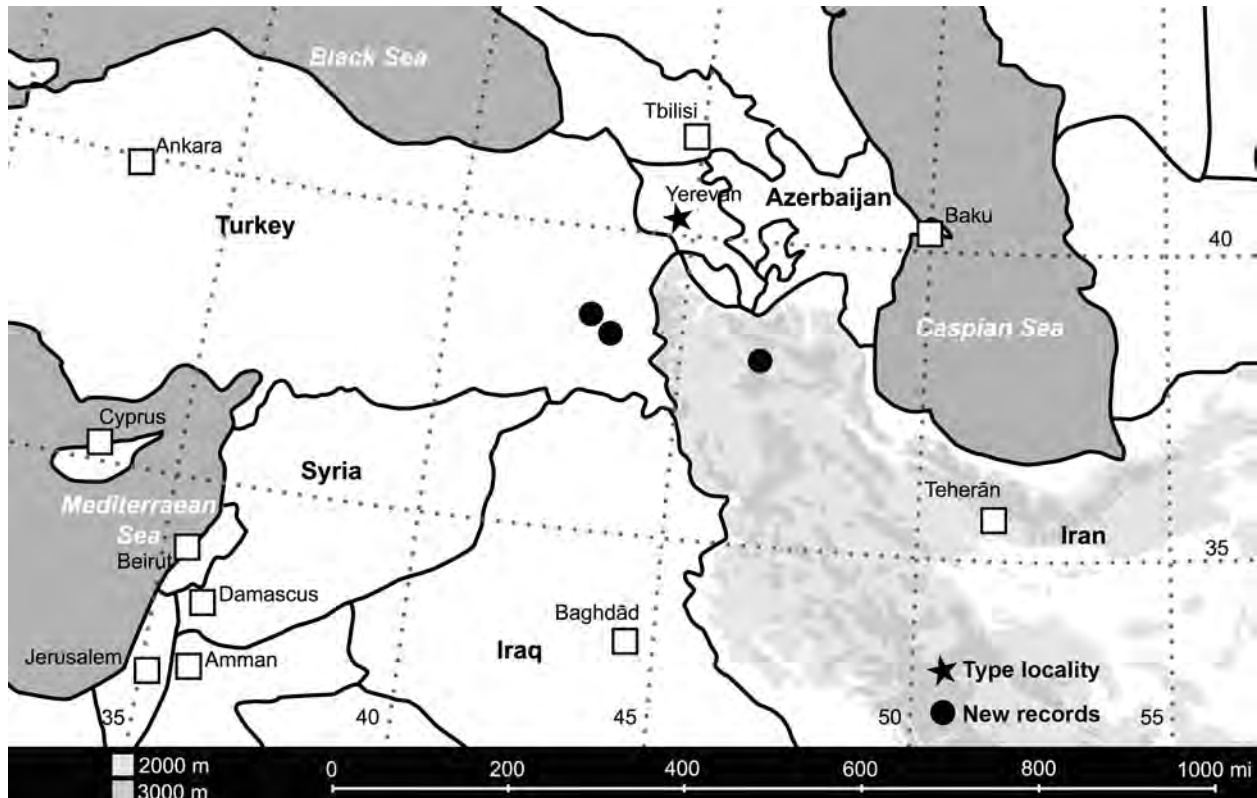


Fig. 6. Distribution map of *Scotopteryx kuznetzovi* (Wardikian, 1957).

scales. Abdomen long, narrow, light grey, with white posterior margins of the segments. Sternites elongate, ST7 and ST8 very small, no coremata developed.

Male genitalia (Fig. 4). Valve broad at base, sacculus sclerotized, without terminal processes; costa band-like, curved, longer than the remaining part of the valva and distally separated from it, with a rounded tip. Sacculus and valve lamina setose. Transtilla a curved, continuous band. Uncus with a broad base and a narrow, acute tip, curved ventrad. Anellus lobes elongate, conical, distally rounded and setose. Aedeagus only a little longer than valve, slightly bent, distal one third covered with the densely spined part of manica (if not removed), vesica with four broad-based cornuti.

Female unknown.

Diagnosis. *S. kuznetzovi* is easily distinguished from other members of the genus *Scotopteryx* by its peculiar appearance and by a number of distinct characters (here compared mainly to members of the *S. vicina*-group, characters in round brackets): elongated forewings with glossy surface, rounded apex and tornus in *kuznetzovi* (forewings less elongated, not glossy, apex less rounded, angled or even slightly falcate; fig. 3); hindwing elongated-oval,

much lighter than forewings and – except a medial band – without pattern (hindwings as dark as forewings and with much more pattern elements); antemedial and post-medial lines strongly wavy and incurved, with deep incisions, sometimes medial band interrupted near hind margin (transverse lines smooth or – in *S. subvicinaria* – slightly wavy, not interrupted; fig. 3); transverse lines highlighted with black inside and white outside, a white submarginal line present (transverse lines not highlighted in this way, submarginal line inconspicuous); antennae bipectinate from base to apex, except distal 2–3 segments (antennae bipectinate and agreeing in all details, but unpectinate distal portion distinctly longer); frons very broad, palps short and acute at tip, haustellum almost completely reduced (frons less broad, palps longer, broader and with rounded tip, haustellum well developed); abdomen without coremata, 7th segment with a small sternite (abdomen with a pair of coremata arising laterally from 7th segment, tergite and sternite of 7th segment reduced, membranous); aedeagus small, only slightly longer than valve, with a few small cornuti on vesica (aedeagus very large, at least two times the length of the valve, cornuti large and numerous; figs 4, 5).

Bionomy. *S. kuznetzovi* seems to be an autumn-flying moth (end of September to end of October), based on the few specimens collected (altitude 1700–2700 m). Food-plant and larval stages are unknown.

Distribution. Armenia, NW Iran and E Turkey (fig. 6).

Taxonomic note. Habitually and in a number of morphological characters *S. kuznetzovi* is very different to and seems to be widely separated from other members of the genus *Scotopteryx*. Wardikian (1957) compared her new species with *S. bipunctaria* (Denis & Schiffermüller, 1775) which, however, has strongly different genitalia structures and belongs to another species-group inside *Scotopteryx*. We found that the male genitalia of *kuznetzovi* agree well and in detail with those of different taxa of the *S. vicinaria* – group (Figs 4, 5). The taxonomy of the latter (comprising *S. vicinaria*, *S. subvicinaria* and their subspecies *brunnescens* Prout, *hyrcanaria* Staudinger, *libanaria* Prout and probably *S. perplexaria* Staudinger) is still not fully understood, but is being revised in the course of further studies on Iranian Larentiinae by the senior author. Male genitalia capsules in all these taxa are extremely similar, specific differences can probably be found only in the number, size and arrangement of cornuti on the vesica, but also these characters seem to be variable. Molecular studies have been started, but the number of barcoded specimens is still too small and the results are not yet satisfactory. Fresh specimens of *kuznetzovi* are urgently needed to decide upon its position within the genus.

Scotopteryx kuznecovi Herbulot, 1996, mentioned in Parsons et al. (1999: 871) in contrast to *S. kuznetzovi* Wardikian, is externally similar to *S. chenopodiata* Linnaeus, 1758 and related taxa. Choi (2002) treated it, as well as *S. golovushkini* Kostjuk, 1991 (Transbaical region) as a junior synonym of *S. acutangulata* Inoue, 1941, described from Korea. Despite an identical origin and pronunciation of *kuznetzovi* Wardikian and *kuznecovi* Herbulot, the differences in spelling do not explicitly fall under

the provisions of the Code (ICZN, 1999, articles 58.1.–58.15), of names deemed to be identical. So they are here not treated as homonyms.

Acknowledgements. We thank Dr. Helen Alipanah (Tehran) for loan of material from HMIM, and Dr. Bernd Müller (Berlin) for helping us in many ways. Sincere thanks of the senior author are also due to Professor Dr. J. W. Wägele (ZFMK, Bonn) for supporting his Ph.D. project and to the DAAD (Deutscher Akademischer Austauschdienst) for financial help. This paper is a part of the Ph.D. thesis of Hossein Rajaei at the University of Bonn, Germany.

REFERENCES

- Choi S-W (2002) Taxonomic Review of the Korean Xanthorhoini (Geometridae: Lepidoptera). *Insecta Koreana* 19: 213–231
- ICZN, International Commission on Zoological Nomenclature (1999) International Code of Zoological Nomenclature, Fourth Edition, adopted by the International Union of Biological Sciences. The International Trust for Zoological Nomenclature, c/o The Natural History Museum, London, 306 pp.
- Parsons MS, Scoble MJ, Honey HR, Pitkin LM & Pitkin RB (1999) The Catalogue. *In*: Scoble MJ, (ed.) *Geometrid Moths of the World: A catalogue* (Lepidoptera, Geometridae). Collingwood, CSIRO Publishing 1046 pp.
- Scoble MJ & Hausmann A [updated 2007] Online list of valid and available names of the Geometridae of the World, http://lepbarcoding.org/geometridae/species_checklists.php Page visited March 5, 2012
- Viidalepp J (1996) Checklist of the Geometridae (Lepidoptera) of the former U.S.S.R. Apollo Books, Stenstrup, Denmark, 111 pp.
- Wardikian CA (1957) Novyj vid pjadensity iz roda *Ortholitha* Hb. (Lepidoptera, Geometridae) iz Armjanskoj SSR [A new geometrid moth species of the genus *Ortholitha* Hb. of the Armenian SSR]. – *Doklady Akademii Nauk Armjanskoj SSR* [Berichte der Akademie der Wissenschaften der Armenischen SSR] 25: 281–283 (in Russian)
- Wardikian CA (1985) Atlas genital'novo apparata pjadensity (Geometridae, Lepidoptera) Armjanskoj SSR [Atlas of the genitalia of geometrid moths of the Armenian SSR]. Izdatel'stvo AN Armjanskoj SSR [Verlag der Akademie der Wissenschaften der Armenischen SSR], Yerevan, 136 pp. (in Russian)