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Aporia ahura Nazari & Naderi, sp. nov., a new species from Central Alborz Mountains in Northern Iran and lectotype designation of *Pieris leucodice* var. *illumina* Grum-Grshimailo, 1890 (Lepidoptera: Pieridae)

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Abstract

Since the publication of this name and the nomenclatural act in a recent paper co-authored by the authors in an online-only journal did not meet the criteria set forth by the ICZN, to make the name the act nomenclatural available, here we re-publish the description of this species and the lectotype designation with proper Zoobank accreditation.
Keywords: Lepidoptera, Pieridae, taxonomy, endemism, Palearctic Region.

Aporia ahura **Nazari & Naderi, sp. nov., una nueva especie de las montañas centrales de Alborz en el norte de Irán y designación del lectotipo de** *Pieris leucodice* **var.** *illumina* **Grum-Grshimailo, 1890 (Lepidoptera: Pieridae)**

Resumen

Dado que la publicación de este nombre y del acto nomenclatural en un artículo reciente de coautoría de los autores en una revista sólo en línea no cumplió los criterios establecidos por el CINZ, para que el nombre del acto sea nomenclaturalmente disponible, aquí volvemos a publicar la descripción de esta especie y la designación lectotipo con la debida acreditación de Zoobank.
Palabras clave: Lepidoptera, Pieridae, taxonomía, endemismo, Región Paleártica.

Introduction

In a recent paper published in Nazari et al. (2024, p. 15), where the Irano-Turanian *Aporia leucodice* species-group were studied, the first two authors of the present paper described a new species of *Aporia* Hübner, [1819] from Central Alborz Mountains in Northern Iran as *A. ahura* Nazari & Naderi, 2024. Unfortunately, since this name and the act were published in an electronic-only journal and the new name was not registered in ZooBank prior to its publication as required by the International Code of Zoological Nomenclature (ICZN 2012, https://www.iczn.org/the-code/electronic-publication-made-available-with-amendment-to-the-code/), the name and the act were nomenclaturaly unavailable. Attempts to submit corrections to this journal post-publication was unsuccessful.

To make the name *Aporia ahura* Nazari & Naderi, 2024 available, here we republish the description of the new species *verbatim* as it appeared in the original study but now with Zoobank registration and a few additional corrections. This should serve as the original description of the new name. For additional information, distribution map, and figures of the adults and genitalia, see Nazari et al (2024).

***Aporia ahura* Nazari & Naderi, sp. nov.**
https://zoobank.org/42067835-6374-4A3D-8413-A0ECB0104EFD

Material: Holotype: ♂, Iran, Alborz Province, Dizin, Varangehrood, 2200 m, 18-VI-2008, leg. A. R. Naderi; SampleID 283b, dissection HA-2964. Not barcoded. Deposited in the coll. National Natural History Museum and Genetic Resources, Tehran, Iran. Paratypes (7 ♂, 5 ♀): Iran, Alborz Province, same data as holotype, 4 ♂, 1 ♀ coll. A. R. Naderi (SampleIDs ARPI-9999-030 to 032); 1 ♂, 3 ♀ leg. A. R. Naderi, coll. P. Zehzad (no SampleIDs); 1 ♂, leg. A. R. Naderi, coll. A. H. Harandi (no SampleIDs); 1 ♂, 2.000 m, 21-VI-2012, leg. A. R. Naderi, coll. P. Zehzad (no SampleIDs); 1 ♀, Chalus road, Dizin, 2.500 m, 2-VII-1994, leg. and coll. A. R. Naderi (barcoded, SampleID ARPI-9999-029).

Description: Male. Head black, frons white with black hairs. Antenna uniformly black, tip of the club white. Thorax black with gray hairs, abdomen black dorsally, grayish white ventrally. Legs black with white scales.

Forewing length 20-22 mm. Dorsal side of wings white; forewing with dark basal suffusion extending from base along the inner margin, veins black, a large black discoidal spot, and a broad marginal band extending from the apex to S2 with white internal scale-shaped patches. Hindwing rounded, white with narrow black margin, veins black only at marginal 1/3 and more intensively developed towards at the edge of the wings; weakly-developed postdiscal markings in the form of small arrows pointing outwards often present in S4-S6. Fringes on both wings gray, uneven. Ventral side of wings contrasted, forewing white except the apical area yellowish within the marginal band; veins grayish at base to more intense blackish towards the margin; discoidal spot and marginal band well-developed, blackish-brown; white internal patches within the marginal band wider than dorsal side and not scale-shaped. Hindwing yellowish, veins broadly suffused with gray scales, an additional streak present along the middle of S1; a continuous postdiscal band of chevrons of similar width extending from the inner margin to the upper half of S1.

Male genitalia: Heavily sclerotized. Ring slender, straight, perpendicular to saccus and tegumen; uncus broad at base, gradually narrowed into a pointed tip; saccus short and broad. Valve nearly triangulate, with dorsal base concave and ventral margin convex, tip blunt, fovea large and dorsoventrally elongate. Aedeagus robust, evenly curved with a trochanter at its ventral base. Juxta v-shaped with two arms widely apart. Female: Forewing length: 22-24 mm. Similar to the male, but wings often ore elongate, upperside dark marginal marking paler, discoidal spot often narrower than male. Ventral side of wings like male, dark markings paler

Female genitalia: Not examined.

Individual variation: The intensity of dark markings on both sides of the wings to some extent vary

Diagnosis: Like the *A. illumina*, forewings wider (narrower and somewhat more elongate in *A. illumina*), ground color and markings generally paler and less developed, UNH patch in S6 always well developed (usually small or obscured in *illumina*); male genitalia valve edge smooth, without pointed tip. Molecular characterization. *Aporia ahura* sp. nov. shows a COI barcode distance of 2.2±1.0% from *A. illumina*, differing from it by 21 fixed substitutions along the 658bp of the DNA barcode region. The available sequences for *A. ahura* sp. nov. (*n*=4) varied in length, nevertheless they showed variation in six additional sites resulting in four different haplotypes. In contrast, all barcoded specimens of *A. illumina* (*n*=12), even though originating from often distant localities, were barcode identical.

Distribution and bionomics: The new species is so far found only in Central Alborz mountains, Alborz province in Northern Iran. In addition to the type locality (Dizin), specimens from Marzanabad in Central Alborz belong to *A. ahura.* The new species inhabits altitudes between 2000-2500 m a.s.l. in mountain slopes with thick vegetation and *Juniperus* trees. Adults fly from mid-June to early July; they have a gentle flight and can often be seen nectaring on flowers of *Berberis* and *Colutea.*

Etymology: The species name *Ahura* (Lord) is an ancient Iranian (Avestan) designation for a particular class of Zoroastrian divinities that also includes *Ahuramazda*, the creator deity in Zoroastrianism.

Additionally, we formally designate here the lectotype of *Pieris leucodice* var. *illumina* Grum-Grshimailo, 1890. The designation of this lectotype is necessary for taxonomic purposes in connection with the description of *Aporia ahura* Nazari & Naderi, sp. nov. and in connection with the clarification of the taxonomic status of taxa related to *Aporia leucodice* described from Iran and Central Asia. For additional information and figures of the lectotype, see Nazari et al (2024).

Aporia illumina Grum-Grshimailo, 1890, **stat. nov.** (Figure 2c in Nazari et al. 2024)
Pieris leucodice var. *illumina* Grum-Grshimailo, 1890, 15
TL: "habitant les pentes septentrionales du Thian-Chan, des monts Alaп et la partie septentrionale de la Perse montagneuse".

Lectotype ♂ (here designated): [white rectangular label: upperside of the label with black border, hand-written in black "Hyrcania"; underside of the label without border, type set "Alph."[eraky collection]/ [large white label] "[Image of Royal crown] /Колл. Вел. Князя / Николая / Михаиловича" / red rectangular label "Lectotype *Pieris leucodide* var. *illumina* Grum-Grshimailo, 1890 Designated by V. Lukhtanov 2024". Deposited in the coll. Zoological Institute, Russian Academy of Sciences (ZIN-RAS), St. Petersburg, Russia. Designated by V. Lukhtanov.

Additional notes: In the original study by Nazari et al. (2024), beside the incorrect year for the taxon *soracta* Moore, [1858] (mentioned as 1857), there is a discrepancy between what is stated in the Results section and the "Proposed taxonomic scheme" on p. 11, particularly in reference to the names *morosevitshae* (a synonym of *leucodice*) and *pseudoillumina* (a synonym of *illumina*). Here we present the corrected the taxonomic scheme as follows:

Aporia belucha Marshall, 1883
ssp. *Aporia belucha* Marshall, 1883. *Proc. zool. Soc. Lond., 1882*(4), 760
ssp. *Pieris leechii* Moore, 1903-1905 ("1904"). *Lep. Ind., 6,* 150
Aporia nabellica (Boisduval, 1836)
ssp. *Pieris nabellica* Boisduval, 1836. *Hist. nat. Ins., Spec. gén. Lépid., 1*, 509
? ssp. *Aporia nabellica hesba* Evans, 1912 (no molecular data available). *J. Bombay nat. Hist. Soc., 21*(2), 559, (3), 976
Aporia soracta Moore, 1858 ["1857"]
ssp. *Aporia soracta* Moore, 1858 ("1857"), in Horsfield & Moore. *Cat. lep. Ins. Mus. East India Coy, 1,* 83
ssp. *Aporia leucodice sara* Evans, 1932. *Ind. Butt.* (edn. 2), 68
Aporia leucodice (Eversmann, 1843)
= *morosevitshae* (Sheljuzhko, 1908). *Rev. rus. ent., 7*(4), 233, **syn. nov.**
ssp. *Pontia leucodice* Eversmann, 1843. *Bull. Soc. Imp. Nat. Moscou, 16*(3), 541, pl. 7, f. 2a-b
ssp. *Metaporia leucodice aryana* Wyatt & Omoto, 1966. *Entomops, 5*, 149
Aporia illumina (Grum-Grshimailo, 1890), **stat. nov.**
ssp. *Pieris leucodice illumina* Grum-Grshimailo, 1890, in Romanoff. *Mém. Lép., 4*, 227
= *Aporia belucha pseudoillumina* Tshikolovets, 2021. *Atalanta, 52*(4), 640, pl. I, fig. 10, **syn. nov.**
***Aporia ahura* Nazari & Naderi, sp. nov.**

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Conflict of Interest

The authors declare that there is no financial interest or personal relationship that could influence the work presented in this article.

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altitude Irano-Turanian mountain plateaus (Lepidoptera: Pieridae). *BMC Ecology and Evolution, 24,* 105. https://doi.org/10.1186/s12862-024-02294-3

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