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Phragmataecia druska – a new species from the Ararat valley in Armenia (Lepidoptera, Cossidae)

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Abstract

New species of the genus *Phragmataecia* Newman, 1850; *Phragmataecia druska* sp. n.; is described from western and central Armenia. It is compared with other species: *Ph. castaneae* (Hübner, 1790); *Ph. albida* Erschoff, 1874; *Ph. furia* (Grum-Grshimailo, 1890); *Ph. roborowskii* Alphéraky, 1897; *Ph. pacifica* Yakovlev, 2007; *Ph. turkmenbashi* Yakovlev, 2008; *Ph. anikini* Yakovlev, 2011; *Ph. valikhanovi* Yakovlev & Witt, 2016; and *Ph. effendii* Yakovlev & Snegovaya, 2020. Adult males, photos and drawings of their genitalia, map with approximate distribution area of *Ph. castaneae* and *Ph. albida* and collection localities of other species, and photos of the habitat for the new species are illustrated.

Key words *Aeluropus* spp. dominated habitat, biodiversity, fauna, new taxon, Transcaucasia, West Asia, Zeuzerinae.

Introduction

The present article continues a series of publications updating the fauna of lepidopterous insects of the Caucasus and its surroundings (Streltsov *et al.* 2022a, 2022b, 2022c, 2024a, 2024b; Huemer & Mayr 2023, Nedoshivina *et al.* 2023, Sinev *et al.* 2023, Anikin *et al.* 2025, Knyazev 2025, Naydenov *et al.* 2025, Pimanchikova *et al.* 2025, Saldaitis *et al.* 2025, Ustjuzhanin *et al.* 2025a, 2025b, Yakovlev *et al.* 2025, etc.). Fauna of the carpenter moths of the area was, so far, summarized for Russia (Yakovlev 2019), Georgia (Didmanidze & Yakovlev 2007), North Caucasus (Yakovlev *et al.* 2015), and the neighboring Iran (Alipanah *et al.* 2021, Rajaei *et al.* 2023).

Here we focus on the genus *Phragmataecia* Newman, 1850. It comprises 11 Afrotropic, 14 Palearctic and 14 Indomalayan species (Ivinskis *et al.* 2012, Rayhan *et al.* 2023). Recently a series of *Phragmataecia* specimens was collected in Armenia (Fig. 1, red tags). Adults (Figs 2–5) have brown speckles on wings resembling *Phragmataecia turkmenbashi* Yakovlev, 2008 (Fig. 6); *Phragmataecia effendii* Yakovlev & Snegovaya, 2020 (Fig. 7); *Phragmataecia pacifica* Yakovlev, 2007 (Fig. 8); *Phragmataecia castaneae* (Hübner, 1790) (Fig. 9); and, somewhat, *Phragmataecia furia* (Grum-Grshimailo, 1890) (Fig. 10); whereas, they are clearly different from *Phragmataecia albida* Erschoff, 1874 (Figs 11–12); *Phragmataecia anikini* Yakovlev, 2011 (Figs 13–14); *Phragmataecia valikhanovi* Yakovlev & Witt, 2016 (Figs 15–16); and *Phragmataecia roborowskii* Alphéraky, 1897 (Fig. 17) that lack speckles on wings. Characteristics of the male genitalia (Figs 18–19) allowed to describe these specimens as a new species.



Figures 1. Approximate distribution of *Phragmataecia castaneae* and *Ph. albida* and collection localities for other *Phragmataecia* species (based on original descriptions and distribution data taken from inaturalist.org, Anikin *et al.* 2017, Yakovlev 2007, Yakovlev *et al.* 2015 etc.). Star is for the type locality, circles – for PTs and non-type specimens. Map data ©2025 Google, TMap Mobility.

Material and Methods

Material. Adult specimens were collected using various light traps. Adult moths deposited in the following collections were examined, photographed and dissected: ASV – collection of Aidas Saldaitis (Vilnius, Lithuania); GMF – collection of Günter C. Müller (Freising, Germany); JDV – collection of Jiří Darebník (Valašské Klobouky, Czech Republic); MPP – collection of Michal Pikner (Polešovice,

Czech Republic); MSW – collection of Manfred Ströhle (Weiden in der Oberpfalz, Germany); MWM – Museum Witt München (presently deposited in the Bavarian State Collection of Zoology (ZSM), Munich, Germany); NHMUK – Natural History Museum (London, UK); RYB – Roman Yakovlev (Barnaul, Russia); WIGJ – World Insect Gallery (Joniškis, Lithuania); XDW – collection of Xavier Dobrzański (Wrocław, Poland); ZISP – Zoological Institute, Russian Academy of Sciences (Saint Petersburg, Russia).

Abbreviations (apart from the depositories) *used*: GS – genitalia slide, LT – lectotype, HT – holotype, PLT – paralectotype, PT – paratype.

Photography and postprocessing. All images were processed with Affinity Photo 2 and Affinity Publisher 2.

Description paragraph. Genitalia nomenclature follows Edwards *et al.* (1999) and Volynkin (2024).

Genitalia dissection. Made following Hardwick (1950). Distal one third of the abdomen of each specimen was put into a separate tube with 10 ml of 13% of potassium hydroxide (KOH) solution. Several tubes with abdomens and KOH were placed into a small pot with hot water for 30 minutes. The tubes thereafter were removed from the pot and the abdomens were rinsed with water several times to remove any remaining scales and soft tissue. Cleaned abdomens were then transferred into separate cells of the Corning Costar 96 Well Cell Culture Cluster with a small quantity of water to keep them moist during preparation. Sequentially, abdomens were cleaned with a soft brush and dissected using fine tweezers and micro scissors in a Petri dish under the microscope. Phallus was extracted and vesica everted (Mikkola 2007; also see Zlatkov *et al.* 2022) with an insulin syringe and a 32G or 33G needle for mesotherapy. Vesica was stained with Evans blue (Evans & Schulemann 1914; Cooksey 2013). The dissected genitalia were rinsed in 50, 70 and 96% ethanol and then mounted on a microscope slide in Euparal (Gilson 1906; Neuhaus *et al.* 2017) and covered with a cover slip. Slides were deposited in the collections respective to the dissected adults.

Taxonomic part

Phragmataecia Newman, 1850

<https://www.zoobank.org/urn:lsid:zoobank.org:act:0EE0DD48-2D0D-4A9D-96F1-8803FEBA5E71>

Zoologist 8, 2931. Type-species: *Noctua arundinis* Hübner, [1808] 1796, *Sammlung europäischer Schmetterlinge*, 4, pl. 83, figs 386, 387, by monotypy (of *Macrogaster* Duponchel, [1845]). Type locality: Europe.

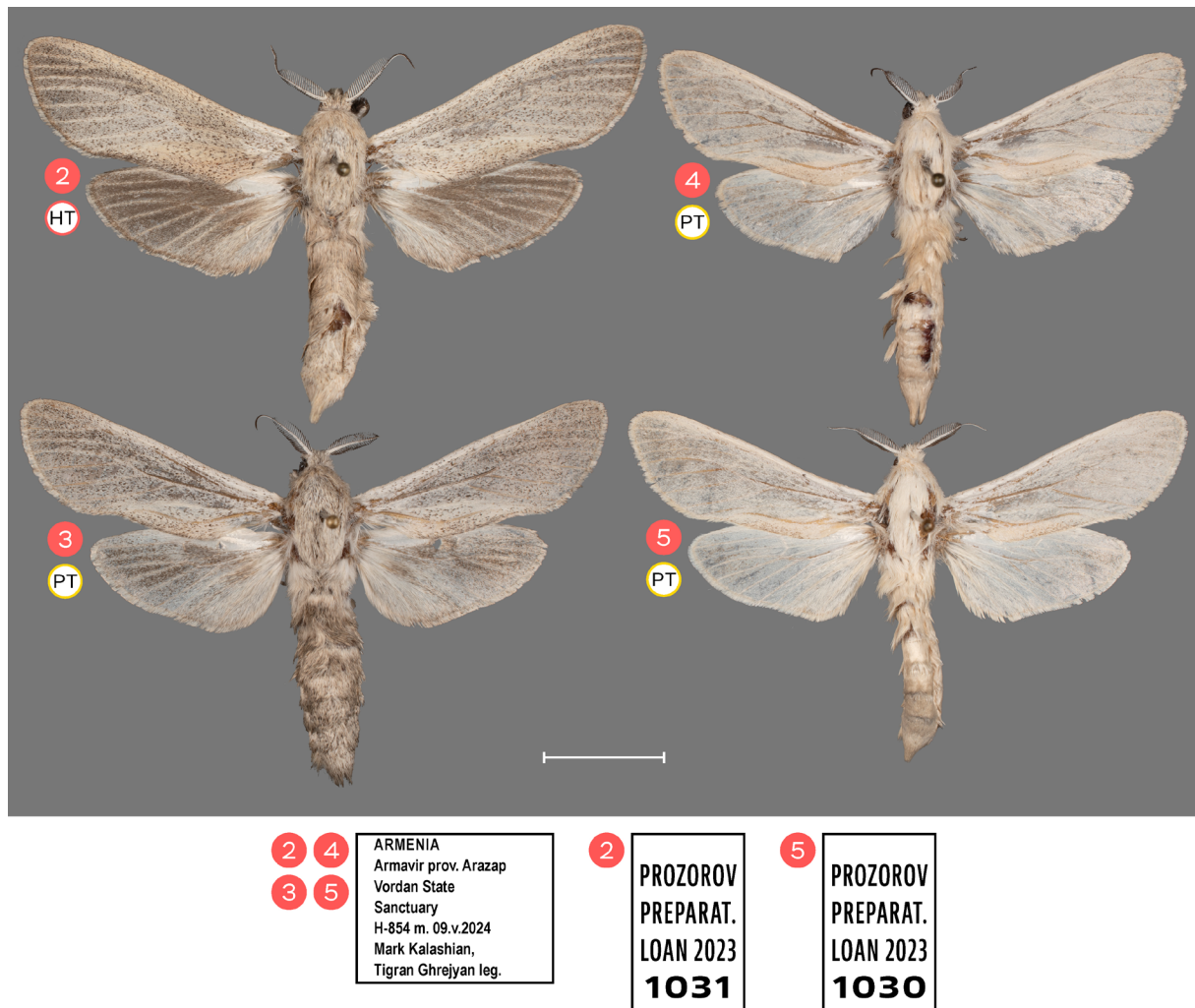
Note: *N. arundinis* is a junior subjective synonym of *Phalaena castaneae* Hübner, 1790, *Beiträge zur Geschichte der Schmetterlinge*, 2 (1), 9. *Phragmataecia* was established as the objective replacement name for *Macrogaster* Duponchel, [1845]. See Fletcher & Nye (1982).

= *Rhizona* Herrich-Schäffer, [1854] 1850–1858, *Sammlung neuer oder wenig bekannter aussereuropäischer Schmetterlinge*, 1(1), wrapper, pl. 35, fig. 169. Type-species: *Rhizona pallens* Herrich-Schäffer, [1854], *ibidem*, by monotypy. Type locality: Guinea.

= ? *Phragmatoecioides* Strand, 1915, *Archiv für Naturgeschichte*, 80(A), 10, 103. Type-species: *Phragmatoecioides pectinicornis* Strand, 1915, *ibidem*, by original designation. Type locality: Sudan: Bahr el Abiad.

= ? *Synatophleps* Hering, 1923, *Deutsche entomologische Zeitschrift Iris*, 37, 15. Type species: *Synatophleps pelostema* Hering, 1923, *ibidem*, by original designation. Type locality: Misahöhe [Togo].

Diagnosis. The genus sometimes confused with *Phragmacossia* Schawerda, 1924 (Saldaitis *et al.* 2023), but differs by shorter uncus (in the most cases), narrower valva, shorter dorsolateral extensions of juxta, about twice narrower and longer phallus without dorsal sclerotized extension.



Figures 2–5. Adults of *Phragmataecia druska* sp. n. Depositories: 2. WIGJ. 3–5. ASV. Scale bar – 1 cm.

***Phragmataecia druska* Saldaitis, Yakovlev & Prozorov sp. n.**

<https://www.zoobank.org/urn:lsid:zoobank.org:act:183076BE-20E0-4F01-94ED-86D622DD2872>

(Figs 2–5, 18–19)

Holotype: ♂, “ARMENIA / Armavir Prov. Arazap / Vordan State / Sanctuary / H-854 m. 09.v.2024 / Mark Kalashian, / Tigran Ghrejan leg.”, GS 2023 1030 (WIGJ; Figs 3, 17).

Paratypes (deposited in ASV, GMF, JDV, MPP, RYB, XDM, WIGJ): 12♂♂, Armenia, Jrarbi, h-990, Vardanashen road, 2025.06.21, leg. Dūda, Pontezis, Butvila; 6♂♂, Jrarbi, 16.6.2025, leg. M. Pikner; 3♂♂, Jrarbi, 16.6.2025, leg. J. Darebnik; 7♂♂, Jrarbi, 23.6.2025, leg. M. Pikner; 1♂, Armenia, Geghard, 16.VI.1995.

Diagnosis. *Phragmataecia druska* sp. n. differs from:

1) *Ph. turkmenbashi* by darker hind wing in dark form (compare Figs 2–3 and 6), narrower uncus, smaller juxta, more pointed apex of valva and saccus (compare Figs 18–19 and 20);

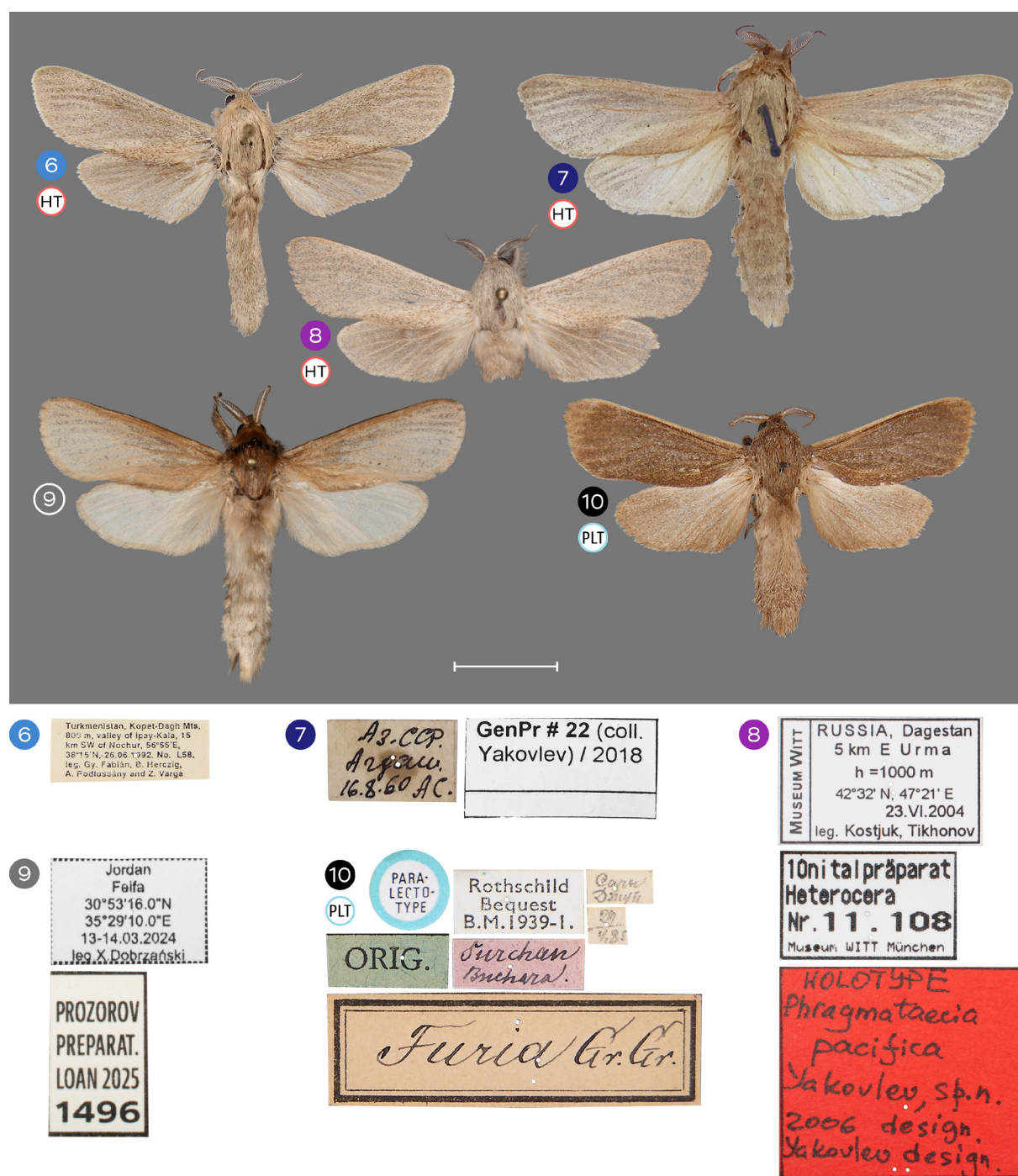
2) *Ph. effendii* by darker hind wing in dark form (compare Figs 2–3 and 7), overall larger genitalia, relatively larger uncus, valva with sharper apex, proximally wider saccus with blunt apex (compare Figs 18–19 and 21);

3) *Ph. pacifica* by slightly darker coloration in dark form (compare Figs 2–5 and 8), sharper apex of valva, better pronounced ventrobasal concavity of valva (shown at Fig. 19), larger dorsolateral processes of juxta (compare Figs 18–19 and 22);

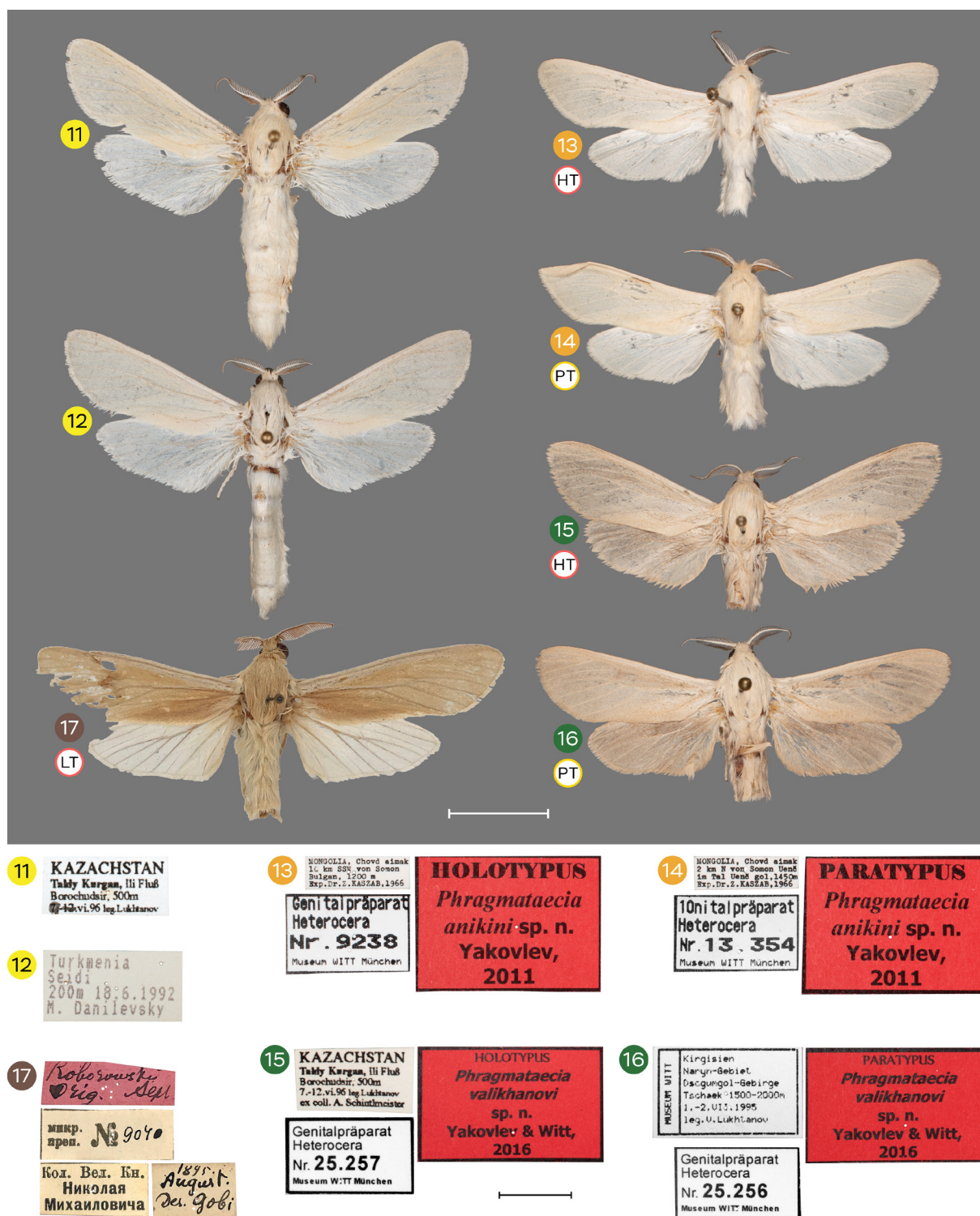
4) *Ph. castaneae* by lack of large brown speckles, darker hindwing in dark form (compare Figs 2–5 and 9), triangular saccus versus variably shaped one in *Ph. castaneae* (compare Figs 18–19 and 24);

5) *Ph. furia* by on average longer forewing (20–24.5 versus 18 mm), lighter coloration (compare Figs 2–5 and 10), slightly wider top of unus, shorter and wider valvam slightly wider phallus (compare Figs 18–19 and 25);

5) *Ph. albida*, *Ph. anikini*, *Ph. valikhanovi*, and *Ph. roborowskii* by presence of brown speckles on fore- and hindwings (compare Figs 2–5 and 11–17), slightly shorter and less curved valva (compare Figs 18–19 and 23, 26–31) with ventromedial concavity (shown at Fig. 19).

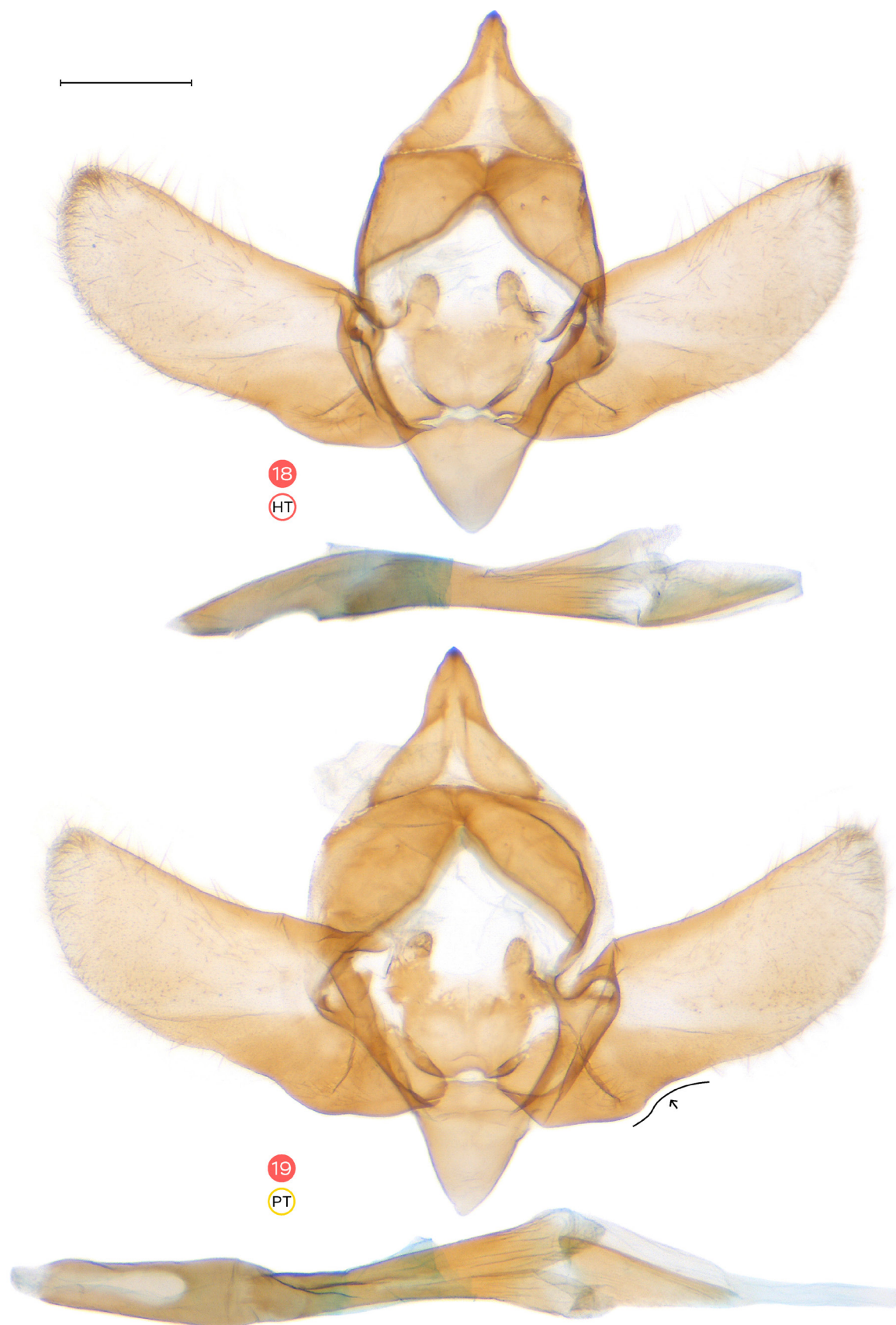


Figures 6–10. Adults of *Phragmataecia* spp. 6. *Ph. turkmenbashi*. 7. *Ph. effendii*. 8. *Ph. pacifica*. 9. *Ph. castaneae*. 10. *Ph. furia*. Depositories: 6. MSW. 7. ZISP. 8. MWM. 9. XDW. 10. NHMUK. Scale bar – 1 cm.

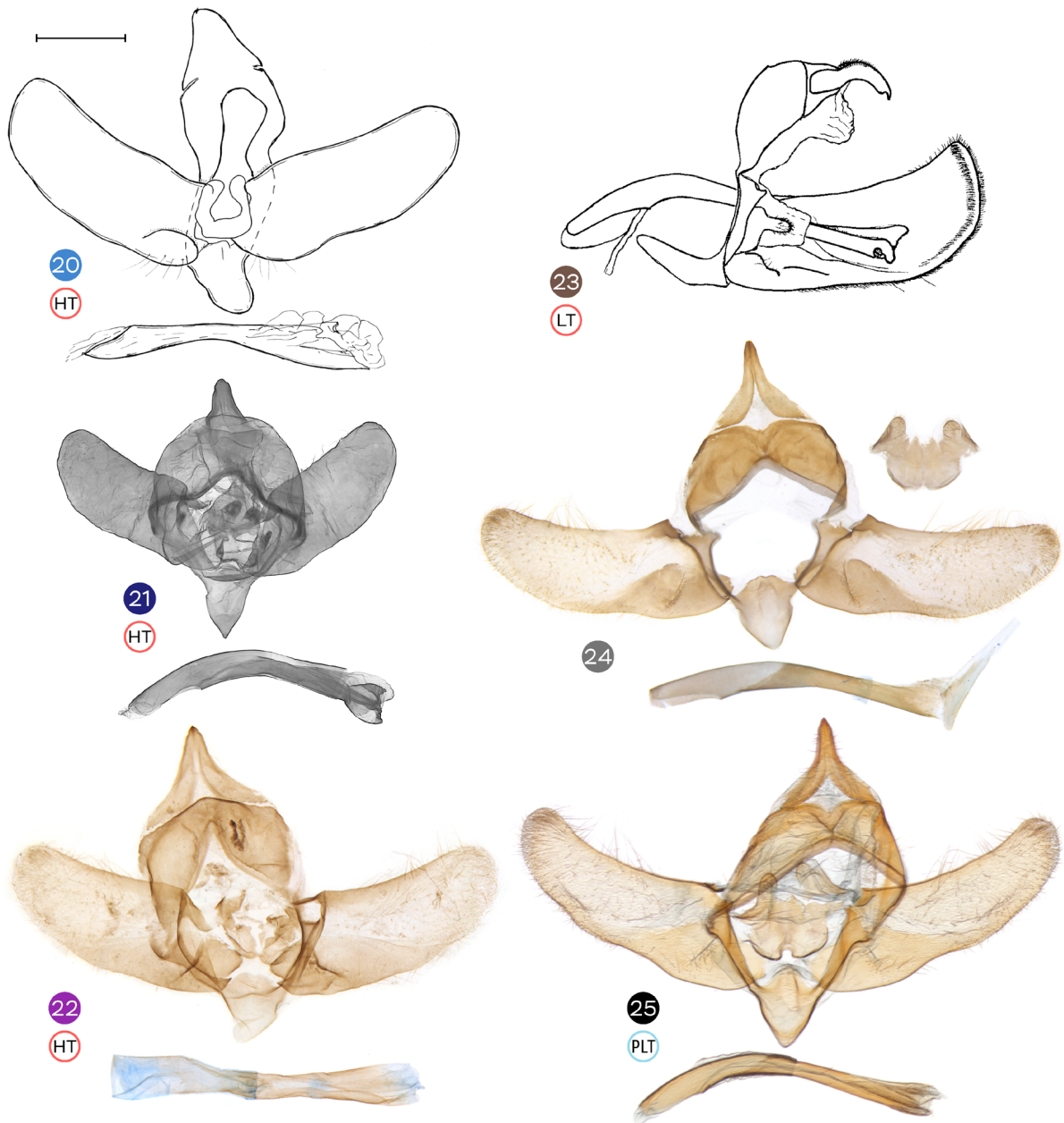


Figures 11–17. Adults of *Phragmataecia* spp. 11–12. *Ph. albida*. 13–14. *Ph. anikini*. 15–16. *Ph. valikhanovi*. 17. *Ph. roborowskii*. Depositories: 11–16. MWM. 17. ZISP. Scale bars – 1 cm.

Description. Male (Figs 16–19). Two forms known: dark- (Figs 16–17) and light-colored (Figs 18–19). Antenna 6–7 mm long; rami gradually elongate in basal third of antenna, then rapidly shorten in distal half of medial third of antenna and stay barely pronounced until the top; flagellum and rami covered with light cream-colored scales and sparse brown scales in dark form. Head, thorax and abdomen dorsally covered with light cream-colored scales in light-colored form or mottled, with cream-colored and brown scales in dark form. *Forewing* 20–24.5 mm long; narrow, long, with protruded obtuse anal



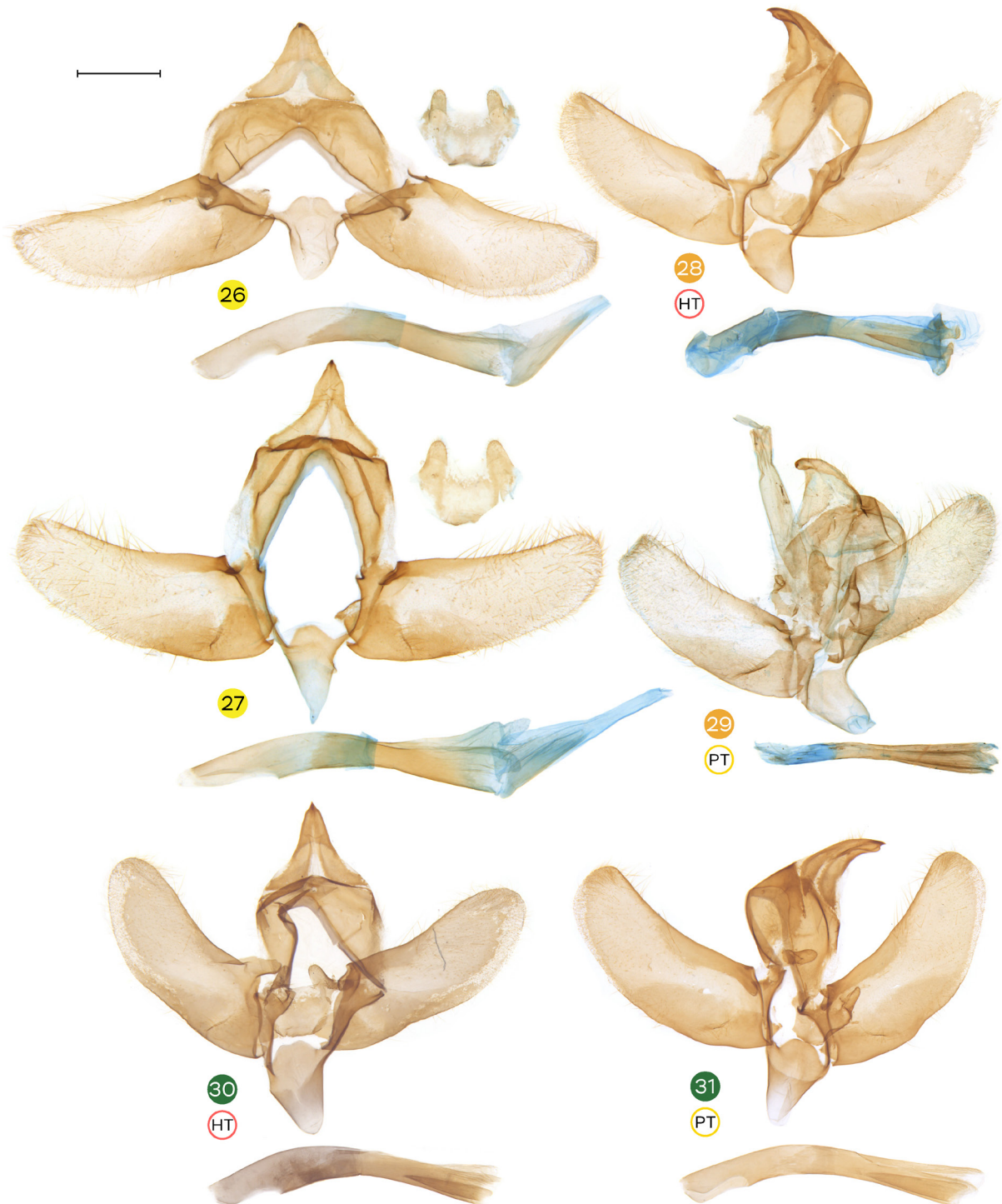
Figures 18–19. Male genitalia of *Phragmataecia druska* sp. n., Armenia, Vordan State Sanctuary. **18.** GS 2023 1031. **19.** 2023 1030. Depositries: **18.** WIGJ. **19.** ASV. Scale bar – 1 mm.



Figures 20–25. Male genitalia of *Phragmataecia* spp. **20.** *Ph. turkmenbashi*, Turkmenistan, 15 km SW Nochur. **21.** *Ph. effendii*, Azerbaijan, Agdash, GS 22/2018. **22.** *Ph. pacifica*, Russia, Daghestan, 5 km E Urma, GS 11.108. **23.** *Ph. roborowskii*, drawing by I. Kozhantchikov (reproduced from Yakovlev, 2007). **24.** *Ph. castaneae*, Lithuania, Vilnius env., GS 2025 1537. **25.** *Ph. furia*, Uzbekistan, Buchara. Depositries: **20.** MSW. **21.** ZISP. **22.** MWM. **23.** ZISP. **24.** GMF. **25.** NHMUK. Scale bar – 1 mm.

and ternal angles, and rounded apex; light creamy-colored with sparse brown scales along anal margin and subterminal area in light-colored form or dark creamy-colored with sparse brown scales in dark form. *Cilia* light creamy colored in light-colored form or mottled, with creamy-colored and sparse brown scales. *Hingwing* somewhat triangular, with rounded anal angle and apex; light creamy-colored with sparse brown scales in light-colored form or light creamy-colored in basal costal area, creamy-colored with sparse brown scales in anal area, and dark creamy-colored with sparse brown scales in medial area towards outer margin in dark form. *Genitalia* (Figs 32–33). Uncus somewhat triangular with lateral concavities; apex rather blunt, harder sclerotized. Tegumen a band with medial concavities, gets narrow towards connection with vinculum. Vinculum a narrow band, ventrally expands into somewhat triangular saccus with rounded apex. Valva as long as tegumen-vinculum complex, medially covered with sparse setae getting denser along outer margin, dorsally almost straight with slight medial

concavity, ventrally rounded, with concavity near sacculus; sacculus sclerotized as hard as dorsal margin. Juxta somewhat of *sella turcica* shape with short upward dorsolateral digitiform processes covered with short setae. Phallus slender, slightly S-shaped, as long as valva, widening towards wide vesical opening; vesica conical, with two short conical processes with rounded apices and medial triangular sclerotized plate. **Female** remains unknown.



Figures 26–31. Male genitalia of *Phragmataecia* spp. **26–27.** *Ph. albida*. **26.** Uzbekistan, Yangiabad, GS 2025 1545. **27.** Uzbekistan, Chimgan Mts, GS 2025 1546. **28–29.** *Ph. anikini*. **28.** Mongolia, 10 km SSW Somon Bulgan, GS 9238. **29.** Mongolia, 2 km N of Somon Uenč, GS 13254. **30–31.** *Ph. valikhanovi*. **30.** Kazakhstan, Borochovsir, GS 25.257. **31.** Kyrgyzstan, Chaek, GS 25.256. All deposited in MWM. Scale bar – 1 mm.

Bionomics and Distribution (Fig. 23). So far only know from three locations in south-western and central Armenia within the Eastern Anatolian montane steppe ecoregion (Olson *et al.* 2001; Dinerstein *et al.* 2017). The type specimens were collected from the altitudes of 854–990 m in May and June.



Figures 32–34. Habitat of *Phragmataecia druska* sp. n. in Armenia, near Jrarbi. Photos © 2025 M. Pikner (32), A. Pontezyte (33–34).

Biotope of the HT and several PTs. The collection site is situated in Armavir marz (province) of Armenia in central part of Ararat plane southwest of Vaghharshapat town in very peculiar and currently endangered habitat. According to EUNIS habitats' classification (Davies *et al.* 2004) adapted to Armenia by Fayvush & Aleksanyan (2016) the ecosystem is classified as *Aeluropus* spp. dominated habitats (E6.251). Such ecosystems were formerly widely distributed in Ararat valley in Armenia, as well as in Turkish part of the valley and in Nakhichevan Autonomous Republic of Azerbaijan. These are typical hygro-halophilous habitats characterized by rather rich and peculiar flora and fauna with dominance of *A. littoralis* (Gouan) Parl. Despite rather deep groundwater standing level located at a depth of 0.75–2.5 m, the appearance of communities usually looks mesophilic. Its flora consists of about 100 species, in the grass coverage usually presented *Alhagi pseudalhagi* (M.Bieb.) Desv. ex Wangerin, *Puccinellia distans* (Jacq.) Parl., *Carex divisa* Huds., *Gypsophila anatolica* Boiss. & Heldr., *Crypsis aculeate* (L.) Aiton, *Atriplex verrucifera* M.Bieb., *Phragmites australis* (Cav.) Trin. ex Steud., as well as number of rare plants included in the Red Book of Plants of Armenia (Tamanyan *et al.* 2010), e.g. *Halostachys belangeriana* (Moq.) Botsch., *Kalidium capsicum* (L.) Ung.-Sternb., *Nitraria schoberi* L., etc. During the last century in Armenia these areas have significantly decreased due to the ongoing measures for desalinization and cultivation of land. According to Sarkisov *et al.* (2010) who measured the range of red-listed Ararat cochineal *Porphyrophora hammelii* Brandt, this range drastically decrease from 3000 ha to 2000 ha during 10 years (1975–1985), and continued decreasing further because of desalination and drainage of soil in vast areas of Ararat valley, and now is presented by rather small and isolated plots surrounded by agricultural lands. Collecting site is situated in one of the two plots of State Sanctuary “Vordan Karmir” established for protection of cochineal which clearly not enough for conservation of this interesting habitats (Kalashian & Fayvush 2022).

Etymology. The species name *druska* is a Lithuanian noun meaning *salt*, given for the hygro-halophilous habitat where the HT was collected.

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