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Hieracium babae, a new species of *Hieracium* s. str. (Asteraceae) from Baba Mt., North Macedonia

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Abstract

A new species, *Hieracium babae* (Asteraceae), is described from Baba Mt. in southwestern North Macedonia. It is found at eight locations, from the montane to the lower alpine zone of the mountain.The general habit and indumentum of the leaves resemble *H. velenovskyi*, an endemic species from Bulgaria and Serbia, but differs in having broader cauline leaves, acute to subacuminate middle cauline leaves, more abundant, longer and dark only at the base simple hairs within the synflorescence, ± paler, shorter and slender glandular hairs, and paler achenes. The possible hybrid origin of the new species is briefly discussed. Photographs of the holotype, living material of the new species, and a comparative herbarium specimen from the type collection of *H. velenovskyi* are presented.

Key words: *H. djimilense* aggregate; holotype; morphology; siliceous substrate; taxonomy.

INTRODUCTION

Baba Mountain (also known as Pelister Mt.) is situated in the southwestern part of North Macedonia and the northwestern part of Greece. Most of its area (over 400 km²), including its highest peak, Pelister (2,601 m), lies within North Macedonia. Despite the relatively uniform siliceous geological composition and consequent limited habitat diversity, the *Hieracium* L. flora in the Macedonian part of this mountain is relatively rich. Although *Hieracium* is poorly studied here, several taxa have already been described from the mountain including *H. macedonicum* Boiss. & Orph. (Boissier 1875), *H. sparsum* subsp. *peristeriense* O. Behr, E. Behr et Zahn (Behr et al. 1937) and *H. pseuderiopus* subsp. *caparinum* Zahn (Zahn 1921–1923).

During field studies of *Hieracium* s. str. on Baba Mt. in 2022, in the valley of the Sapundžica River, I collected a few specimens of a fairly hairy representative of *H*. sect. *Prenanthoidea*, whose identification proved problematic, as it differed markedly from all other known species in the region. After an unsuccessful field search in 2023, I collected numerous specimens from seven additional localities on this mountain in 2024 and 2025, enabling a more precise and reliable identification. Detailed comparative morphological analysis revealed that the material belonged to a hitherto undescribed species. The next step was to provide a morphological description, suggest its putative origin, and establish its relationship with closely related taxa, as presented in this article.

MATERIAL AND METHODS

Field studies were carried out on Baba Mt., North Macedonia, between 2022 and 2025. Representative plants were prepared as herbarium specimens. The holotype is deposited in the Herbarium of the Institute of Biology, Faculty of Natural Sciences and Mathematics in Skopje (MKNH), while other specimens are preserved in the author's private herbarium and the Herbarium of the Natural History Museum of the Republic of North Macedonia (HMMNH). Photographs of living plants, along with data on the habitats and populations, were recorded in the field. The collected material was used for a comparative morphological study. Numerous scans of type specimens and other herbarium collections of relevant taxa stored in European herbaria were used for comparison, including high-quality scans of three herbarium sheets from the type collection of *H.velenovskyi* Freyn (leg. J. Velenovský), comprising one specimen from Vitoša Mt. (Bulgaria) (BRNM 08603/36) and six from Stara Planina Mt. (Bulgaria) (BRNM 08605/35, 08606/35). Also examined were scans of specimens of the same species collected on Vitoša Mt. (Bulgaria) by C. Keck & Th. Pichler (W 5471, 5470, 7720), I. Urumov (SOM 89675, 89676), T. Georgiev (SOM 131010) and by M. Niketić (BEO).

RESULTS AND DISCUSSION

***Hieracium babae* Teof., sp. nov**. (Figs. 1-7)

Description: *Stems* solitary or few, 40–90 cm high, up to 4 mm in diameter at base, erect, sometimes slightly flexuous, finely striate, olivaceous-green, tinged with purplish at base or rarely ± throughout, covered with numerous to dense, 1.5–3.0 mm long, whitish simple hairs, ± curved and deeply dentate to subplumose in lower part, less deeply dentate, dark based, somewhat stiff, and usually ± horizontally patent in middle and upper part; upper third also with scattered stellate hairs, accompanied apically by sparse ± pale, 0.2–0.4 mm long glandular hairs; scattered or solitary microglands often occur throughout. *Basal leaves* (2)3–4, withered at anthesis, oblanceolate to narrowly obovate, 6–12×1.8–3.0 cm, gradually or abruptly narrowed into winged petiole, obtuse, usually mucronate, denticulate; both surfaces covered with ± moderately dense deeply dentate to subplumose, 1–2 mm long simple hairs, dense on midrib and petiole beneath; margins densely ciliate; scattered or solitary microglands usually present on margins, and on midrib and along margins beneath; stellate hairs absent in all leaves. *Cauline leaves* (6–)8–11(–12), lowermost 1–2 sometimes withered at anthesis, ± soft except for the upper ones or in sunny places all ± coriaceous, usually ± undulate, green or olivaceous-green above, paler and sometimes slightly reticulately veined beneath; remotely and acutely denticulate to dentate, sometimes irregularly, with 1–3 coarser teeth on each side; ± evenly distributed, lower most leaf usually located near the base; lower and middle leaves gradually decreasing in size or lowermost smaller than proximal; upper leaves much smaller than middle, ± abruptly decreasing in size and transitioning into bracts. *Lower cauline leaves* oblanceolate to broadly oblanceolate or narrowly oblong-elliptic, gradually narrowed into a broadly winged petiole or shortly narrowed at often subpanduriform and amplexicaul base, acute to subobtuse, mucronate, including petiole or narrowed part 12–25 cm x 2.0–3.0 (in shady habitats up to 4.0) cm; both surfaces covered with numerous to moderately dense, deeply dentate to subplumose, 1-2 mm long simple hairs, dense on midrib and petiole beneath, margins densely ciliate; microglands as in basal leaves. *Middle cauline leaves*, oblanceolate, broadly oblanceolate, narrowly obovate, to narrowly (oblong) elliptic, acute, sometimes subacuminate, ± shortly narrowed (often subpanduriformly) to ± clasping amplexicaul base, indumentum as in lower leaves but with reduced dentation of simple hairs, and upper or both surfaces often glabrescent in narrow or broad area along midrib. *Upper cauline leaves* lanceolate, truncate or somewhat attenuate at base, or more frequently with cordate, semiamplexicaul base, acuminate, acute; indumentum as in middle cauline leaves but often more glabrescent. *Synflorescence* panicle, with 4–20 developed erect or rarely slightly inclined capitula and few to several aborted. *Branches* (2–)4–6(–7), arranged in upper ½–1/7 of stem, with 1–7 developed capitula, longest one 5–17 cm long; with numerous to dense or occasionally sparse on some branches, 1.5–3.5 mm long, usually ± stiff and horizontally patent, whitish, dark-based simple hairs, numerous to sparse, often becoming solitary downwards, entirely pale or ± darkish in lower half, slender, 0.2–0.4 mm long glandular hairs with yellowish glands, and scattered stellate hairs; acladium 8–20(–30) mm. *Peduncles* up to 30(–35) mm long, green or olivaceous-green; simple hairs as in branches; glandular hairs as in branches but ± dense; stellate hairs numerous to sparse; bracteoles 2–4, with dense simple and glandular hairs. *Capitula* 20–25 mm in diameter. *Involucres* 9–11 mm long, ovate at base; with numerous to subdense, whitish, dark-based, 1.5–3.5 mm long simple hairs, glandular hairs as in peduncles, and few to sparse stellate hairs at base; bracts lanceolate, up to 1.5 mm wide at base, obtuse to subacute, dark green, inners with broad pale margins. *Ligules* short, yellow, at expanded stage with glabrous or slightly ciliate apex. *Styles* greenish-brown. *Achenes* straw-colored, ca. 4 mm long. *Pappus* pale grayish. *Flowering time:* July.

Holotype: North Macedonia, Baba Mt., near road to mountain hut Široka, shrubby place near *Pinus peuce* forest, silicate, 1622 m, 41.026154°N, 21.181082°E, 10.7.2024, leg. & det. A. Teofilovski (MKNH, 071919).

Isotypes: HMMNH; herb. A. Teofilovski.

Other collections examined (paratypes): Baba Mt., above Sapundžica River, shrubby place, silicate, 1550 m, 40.964256°N, 21.242011°E, 23.7.2022, leg. & det. A. Teofilovski (herb. A. Teofilovski); Baba Mt., above Sapundžica River, sparse forest, silicate, 1421 m, 40.971753°N, 21.250276°E, 16.7.2024, leg. & det. A. Teofilovski (herb. A. Teofilovski); Baba Mt., above Sapundžica River, acidophilic heath, silicate, 1879 m, 40.956328°N, 21.215730°E, 16.7.2024, leg. & det. A. Teofilovski (herb. A. Teofilovski);Baba Mt., above Sapundžica River, acidophilic heath, silicate, 1858 m, 40.956050°N, 21.218102°E, 16.7.2024, leg. & det. A. Teofilovski (herb. A. Teofilovski); Baba Mt., near path between Magareška River and Jorgov Kamen, *Pinus peuce* forest, 1725–1735, 41.022948°N, 21.218655°E, 28.7.2024, leg. A. Teofilovski & Z. Nikolov, det. A. Teofilovski (herb. A. Teofilovski); Baba Mt., near road to mountain hut Široka, margin of *Pinus peuce* forest, silicate, 1658 m, 41.023637°N, 21.175536°E, 23.7.2025, leg. & det. A. Teofilovski (herb. A. Teofilovski); Baba Mt., above Malo Ezero, acidophilic heath and stony places, silicate, 2263m, 40.976586°N, 21.184633°E, 23.7.2025, leg. & det. A. Teofilovski (herb. A. Teofilovski).

Distribution and ecological preferences:

H. babae is endemic to Baba Mt. in the southwestern part of North Macedonia. It is a rare species, currently known from eight populations, each consisting of about 5 to 50 individuals. These localities form a polygonal area of 27 km², mostly consisting of suitable habitats for the species, so additional populations are likely to be found within the area. The typical habitats of this species include acidophilic heaths with *Vaccinium myrtillus* and *Juniperus sibirica, Pinus peuce* forests, and forest margins, all occurring on siliceous substrates. The altitudinal range where it has been observed so far extends from 1421 to 2263 meters a.s.l.

Additional field studies on Baba Mt. are needed to determine the full distribution range and population size of the species and to assess its conservation status.

Taxonomic discussion:

Based on its general habit and leaf indumentum, *H. babae* most closely resembles *H. velenovskyi* Freyn (= *H. vitošense* Zahn) (Fig. 7), originally described from the Vitoša, Stara Planina, and Rila mountains in Bulgaria (Freyn 1891), and also occurring in Serbia (Vlasina Mt.) (Zahn 1936–1938). *H. velenovskyi* is considered a member of the *H. djimilense* aggregate, whose putative hybrid origin was interpreted by Zahn (1921–1923, 1936–1938, as *H. djimilense* Boiss.) as *H. sparsum* ≤ *H. prenanthoides*. The main differences between *H. babae* and *H. velenovskyi* are presented in Table 1.

H. babae may also be of hybrid origin, similar to that suggested for the *H. djimilense* aggregate. The influence of *H. prenanthoides* s.l. is evident in the following morphological features: clasping, amplexicaul middle cauline leaves, often with a subpanduriformly narrowed base; occasional ± reticulate venation on the cauline leaves; and frequent occurrence of cilia at the apex of the expanded ligules. Although neither *H. prenanthoides* s.l. nor its known putative hybrid derivatives have been recorded on Baba Mt. so far, *H. prenanthoides* subsp. *bupleurifolium* (Tausch) Zahn has been found in the Macedonian part of the nearby Galičica Mt. (Zahn 1936–1938), and *H. prenanthoides s.*l. on Bistra Mt. (Teofilovski 2023).

The influence of *H. sparsum* s.l. (*H. sect. Cernua*) in the putative hybrid origin of *H. babae* is less evident, but it might be reflected in the occasional occurrence of slightly inclined capitula, the morphology of the simple and glandular hairs within the synflorescence, and in the elongated shape of the leaves. Several representatives of *H. sparsum* s.l. are known to occur on Baba Mt. (unpublished data). However, the deeply branched simple hairs in the lower plant parts of *H. babae* [1.5–2.5(–3.5) times the diameter of the hairs] might indicate influence also from a representative of H. sect. *Pannosa* or its hybridogenous derivatives, both of which occur on Baba Mt. (unpublished data). Therefore, the placement of *H. babae* within the *H. djimilense* aggregate is provisional.

Etymology: The name of the new species refers to Baba Mountain (southwestern North Macedonia), where it occurs as a local endemic.

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I am grateful to Dr. Marjan Niketić (Natural History Museum, Belgrade) for providing high-quality scans of numerous herbarium specimens of *Hieracium velenovskyi* from Herbarium BEO and Herbarium SOM, and to Dr. Vojtěch Taraška (Moravské zemské muzeum, Brno) for providing high-quality scans of three specimens from the original collection of *H. velenovskyi* deposited in Herbarium BRNM. I also thank Herbarium BRNM for kindly permitting the use of the scan of herbarium sheet BRNM 08603/36 in Fig. 7. I am grateful to two anonymous reviewers for reviewing the manuscript and for their valuable suggestions for improving it.

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Table 1. Morphological and distributional differences between *Hieracium babae* and *H. velenovskyi*.

	Hieracium babae (Figs. 1-7)	***H. velenovskyi*** (Fig. 8)
lower and middle cauline leaves	acute or middle subacuminate	acuminate, acute
width of widest cauline leaf	2.0–4.0 cm	up to 2.0(3.0) cm
morphology of simple hairs on peduncles and involucres	whitish with dark base, 1.5–3.5 mm long	blackish, up to 1.5 mm long
density of simple hairs on peduncles	sparse to dense	solitary to few
density of simple hairs on involucres	numerous to subdense	few to sparse
morphology of glandular hairs on peduncles and involucres	entirely pale or darkish in lower half, with yellowish glands, slender, up to 0.4 mm long	blackish, ± robust, up to 0.7 mm long
apex of expanded ligules	glabrous or slightly ciliate	± ciliate
color of achenes	straw-colored	pale or chestnut brown
distribution	endemic to Baba Mt. in SW North Macedonia	Bulgaria (Vitoša, Stara Planina, and Rila mountains) and Serbia (Vlasina Mt.)

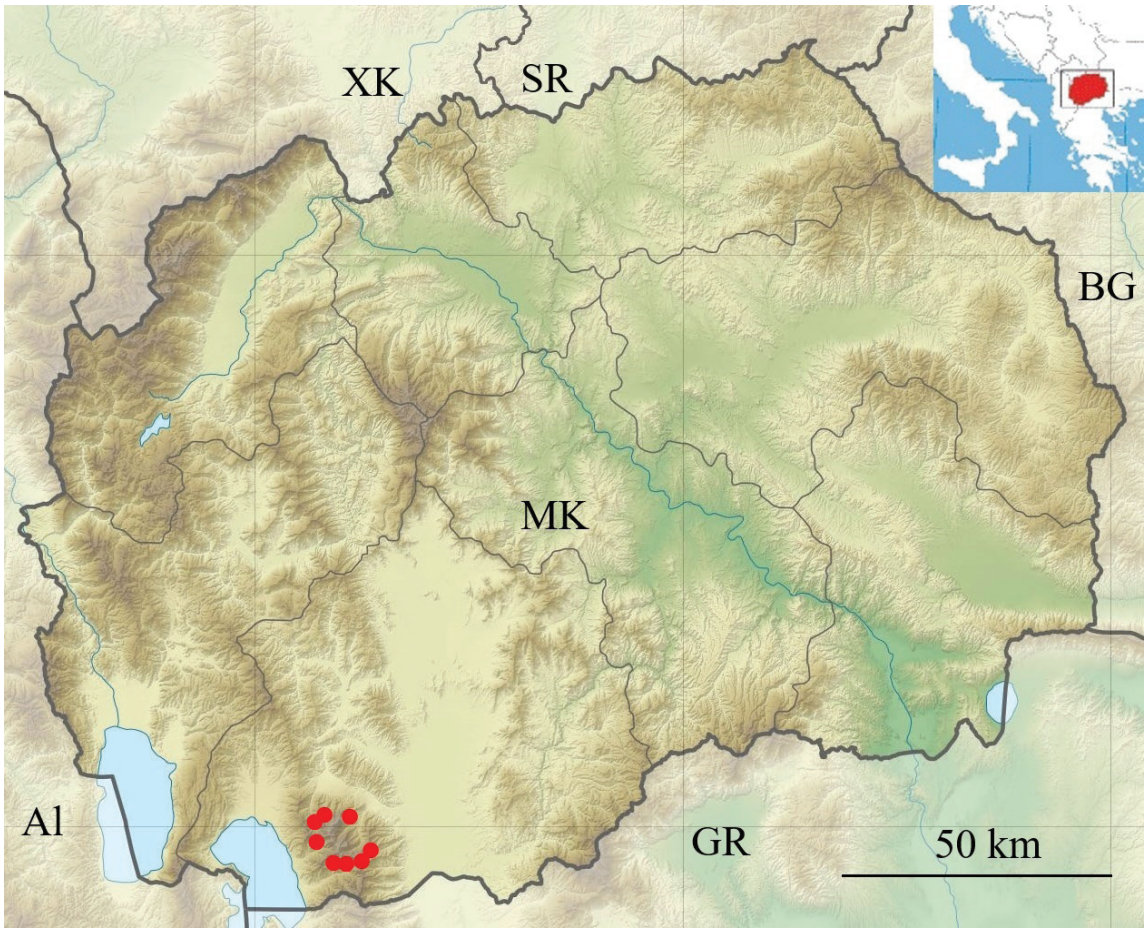

Fig. 1. General distribution of *Hieracium babae*.

Fig. 2. Holotype of *Hieracium babae* (MKNH, 071919).

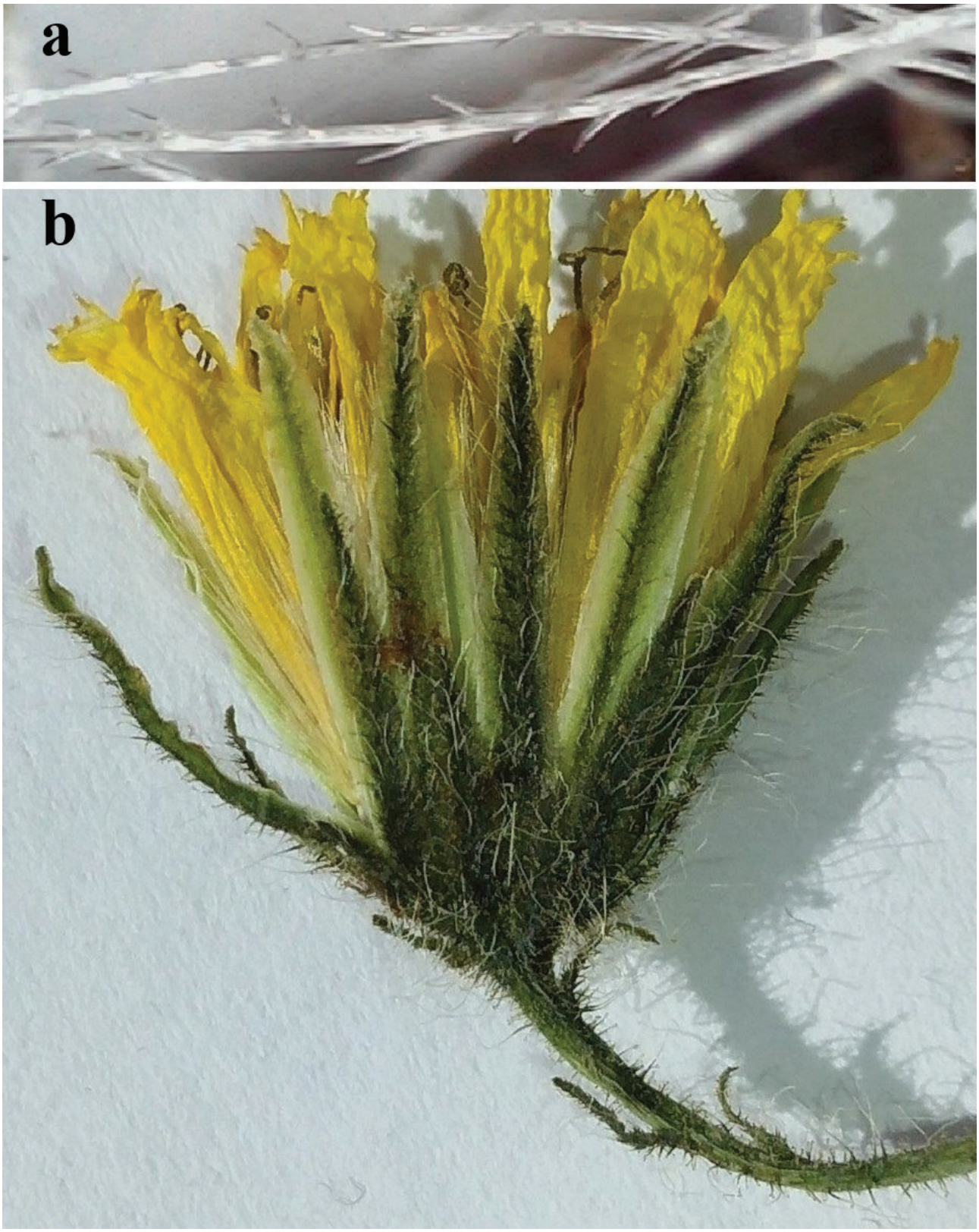

Fig. 3. Details from the holotype of *Hieracium babae*:
a. simple hairs from the lowermostcauline leaf;
b. capitulum. (Photo A. Teofilovski)

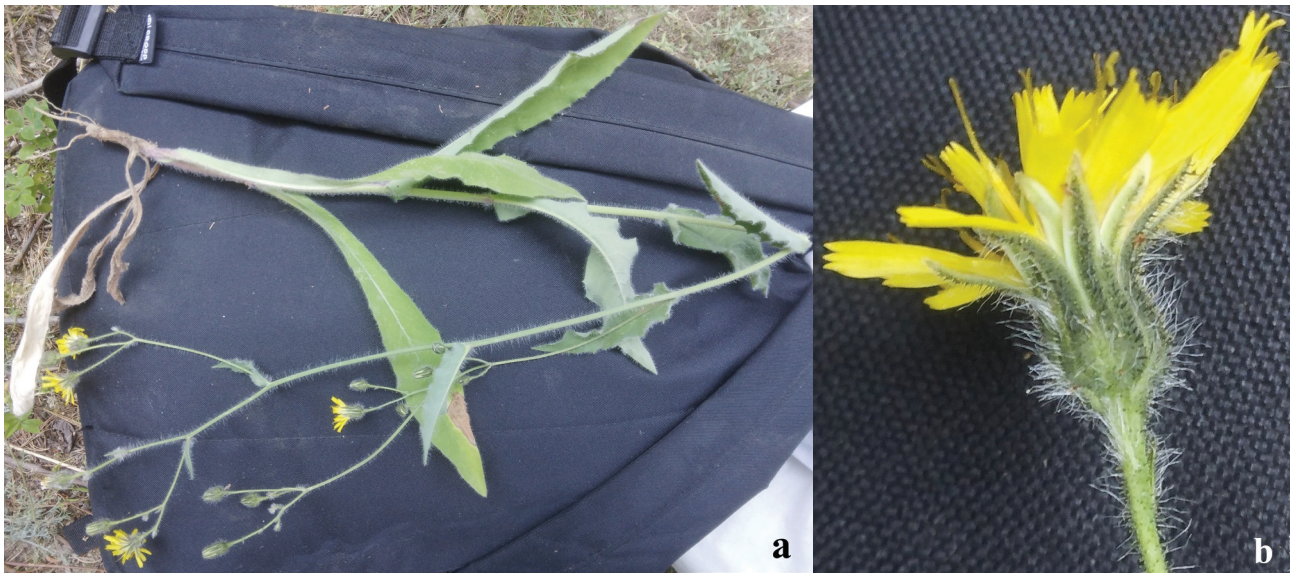

Fig. 4. *Hieracium babae:*
a. specimen from the type locality;
b. detail – flowering capitulum.
(10.7.2024, photo A. Teofilovski)

Fig. 5.*Hieracium babae*,
specimen on the type locality.
(10.7.2024, photo A. Teofilovski)

Fig. 6. *Hieracium babae:* a. plants in natural habitat; b. detail – basal part of a middle cauline leaf; c. detail – achenes. (Baba Mt., above Sapundžica River, 1858 m,16.7.2024, photo A. Teofilovski)

Fig. 7 *Hieracium babae*: **a.** plants in natural habitat; **b**.detail – part of synflorescence. (Baba Mt., above Sapundžica River, 1550 m, 23.7.2022, photo A. Teofilovski)

Fig. 8. *Hieracium velenovskyi,*
a. specimen from the type collection (lectotype) collected by J. Velenovský on Vitoša Mt. in Bulgaria (BRNM 08603/36); **b.**detail - fruiting capitula, scale bar 5 mm.