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Four new species of the microsnail genus *Bensonella* Pilsbry & Vanatta, 1900 (Gastropoda: Stylommatophora: Hypselostomatidae) from Vietnam and Laos

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Abstract. Four new species of the microsnail genus *Bensonella* are described based on their shell morphology: *Bensonella basaoensis*, new species, from Ninh Binh province, Vietnam, possesses an elongate-conic shell with nine apertural barriers, upper palatal plica very large and strongly curved, resembling a broad wing; *Bensonella copiaensis*, new species, from Son La province, Vietnam, has a minute, triangular, conical-ovoid shell with eight apertural barriers, upper palatal plica elevated and closely abutting palatal tubercle; *Bensonella magnisinulosa*, new species, from Dien Bien province, Vietnam, shows an aperture with two distinct cavities: large sinulus and rectangular remaining cavity, angular lamella strong, distinctly elevated, reaching peristome, and twisted; *Bensonella expansa*, new species, from Xieng Khouang province, Laos, has a triangular-conical shell with nine apertural barriers, angular lamella prominent, largest among apertural barriers, reaching peristome and extending deep into aperture. The discovery of these new species highlights the significance of northern Vietnam and Laos as centres of *Bensonella* diversity.

Key words. taxonomy, microsnails, limestone, Laos, Vietnam

INTRODUCTION

Hypselostomatidae is a large family of terrestrial pulmonate microsnails, primarily occurring in Southeast Asia and China. The family's distribution range also extends to adjacent regions, including India and Pakistan to the northwest, Japan to the northeast, and Australia to the south, but with reduced diversity (Schileyko, 1998; Pokryszko et al., 2009; Páll-Gergely & White, 2023; Páll-Gergely et al., 2015, 2017, 2023; Tongkerd et al., 2024; Gojšina et al., 2025). Species assigned to the Hypselostomatidae are primarily based on shell characteristics. Diagnostic characters of these species include their minute size (generally less than 5 mm), a depressed-conical to conical shell shape, the last whorl often detached from the penultimate to varying degrees, and apertural barriers that are commonly present and variable in both number and arrangement (Schileyko, 1998; Páll-Gergely & White, 2022; Tongkerd et al., 2024; Gojšina et al., 2025).

To date, 313 species across 13 genera have been recorded within the family Hypselostomatidae, most of which inhabit limestone environments and exhibit narrow-range endemism (Tongkerd et al., 2024; Gojšina et al., 2025; MolluscaBase, 2025). Within this context, Vietnam and Laos, both featuring diverse ecosystems and extensive limestone regions, stand out as areas with high potential for hypselostomatid diversity (Tran et al., 2005; Sterling et al., 2008; Inkhavilay et al., 2019, 2024). The complex topography, well-developed karst systems, and heterogeneous habitats in these countries provide numerous microhabitats suitable for terrestrial microsnails, highlighting their significance as centres for both known and yet undiscovered species (Inkhavilay et al., 2019; Páll-Gergely et al., 2019, 2023).

The genus *Bensonella* Pilsbry & Vanatta, 1900 was originally described as a subgenus of *Bifidaria* Sterki, 1891 (currently treated as a synonym of *Gastrocopta* Wollaston, 1878). It was later recognised as a distinct genus based on diagnostic characters that clearly differentiate it from other genera within the family Hypselostomatidae, including a continuous peristome with a well-developed callus, a distinct palatal tubercle on the palatal lip, three barriers on the parietal wall (angular, parietal, and infraparietal), and apertural barriers commonly present on the palatal, basal, and columellar walls (Zilch, 1959; Schileyko, 1998; Páll-Gergely & White, 2023; Jirapatrasilp et al., 2024; Gojšina et al., 2025). The genus has a wide distribution range, with numerous species in mainland Southeast Asia, particularly in Myanmar, Thailand, Laos, and northern Vietnam (Panha & Burch, 2002a, 2002b; Schileyko, 2011; Gojšina et al., 2025). Fewer species have been recorded from other regions such as China, Indonesia, and India (van Benthem Jutting, 1950, 1952; Panha et al.,

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2003; Jirapatrasilp et al., 2024; Gojšina et al., 2025). Given that many limestone habitats in the region remain unexplored, it is likely that additional species await discovery.

In this study, we describe four new species of *Bensonella* from northern Vietnam and Xieng Khouang Province, Laos.

MATERIAL AND METHODS

This study is based on material collected during field surveys conducted at various localities in Vietnam and Laos between 2013 and 2025. Specimens were obtained by soil sieving and manual searching. Leaf litter accumulated at the base of limestone walls was also collected and examined under a stereomicroscope to recover empty shells. The shells were cleaned of dirt and mud using fine-tipped brushes.

All shells were measured using a Zeiss SteREO Discovery. V8 microscope equipped with a digital camera. Selected specimens were also examined by scanning electron microscope (SEM; JEOL, JSM-IT200) in the Joint Vietnam-Russia Tropical Science and Technology Research Centre (Hanoi, Vietnam). The number of whorls was determined to the nearest 0.25 whorl, following the method of Kerney & Cameron (1979). Shell photographs were taken using a Nikon® Z6 II camera mounted with coupled reversed lenses (Nikkor 180mm f/2.8 AIS and Nikkor 50mm f/1.8 D). Depth of field (DoF) was achieved by stacking 20 to 40 images using Helicon Focus® 7.6.1. Terminology for apertural barriers follows Pilsbry (1918, 1948), Páll-Gergely & White (2022), and Gojšina et al. (2025).

Institutional abbreviations

VFM – Vietnam Forest Museum, Forest Inventory and Planning Institute, Hanoi, Vietnam
VNMN – Vietnam National Museum of Nature, Hanoi, Vietnam
ZRC – Zoological Reference Collection of the Lee Kong Chian Natural History Museum, National University of Singapore, Singapore
ZVNU – Zoological Collection of Biological Museum, VNU University of Science (Vietnam National University, Hanoi), Vietnam.

SYSTEMATICS

Class Gastropoda Cuvier, 1795

Subclass Heterobranchia Burmeister, 1837

Order Stylommatophora Schmidt, 1855

Superfamily Pupilloidea Turton, 1831

Family Hypselostomatidae Zilch, 1959

Genus *Bensonella* Pilsbry & Vanatta, 1900

Bifidaria (*Bensonella*) Pilsbry & Vanatta, 1900: 591.
Boysidia (*Bensonella*) – Pilsbry, 1917: 198.
Boysidia (*Paraboysidia*) Pilsbry, 1917: 174, 201.
Bensonella – Zilch, 1959: 164; Schileyko, 1998: 139, 140; Páll-Gergely & White, 2023: 2014; Jirapatrasilp et al., 2024: 90; Inkhavilay & Sutcharit, 2024: 444; Tongkerd et al., 2024: 167; Gojšina et al., 2025: 50.

Type species. *Pupa plicidens* Benson, 1849, by original designation.

Remarks. The diagnostic characters of the genus *Bensonella* have been clarified in several recent publications, which distinguish it from other congeners (Schileyko, 1998; Páll-Gergely & White, 2023; Jirapatrasilp et al., 2024; Inkhavilay & Sutcharit, 2024; Tongkerd et al., 2024). Recently, the genus was comprehensively revised and divided into two species groups by Gojšina et al. (2025). The *Bensonella plicidens* species group includes the majority of species and is characterised by a distinct palatal tubercle on the palatal wall and three barriers on the parietal wall (angular, parietal, and infraparietal). In contrast, the *Bensonella wangviangensis* group comprises fewer species and is defined by a triangular-conical shell shape, a strongly developed angular lamella that reaches the peristome, a lamella-like palatal tubercle, and an angular lamella and palatal tubercle approaching each other and forming a narrow canal leading to the sinulus (Gojšina et al., 2025).

Bensonella basaoensis, new species

(Figs 1–3, 12A)

Material examined. Holotype ZVNU.MOL. 054 (shell height 5.0 mm, shell width 3.2 mm, 6½ whorls; Figs 1A–E, 12A) from a limestone karst mountain near the Tam Chuc Pagoda, Tam Chuc ward, Ninh Binh province, Vietnam (20°35′10.5″N, 105°49′03.8″E), leg. D.S. Do & H.N. Dao, 28 December 2024. Paratypes: ZRC.MOL.35092 (3 shells), ZVNU.MOL. 055 (10 shells; Figs 3A–H), VNMN-IZ 000.002.351 (2 shells; Figs 2F–J), VFM.MOL. 0003 (2 shells; Figs 2A–E), all collected from the type locality together with the holotype.

Diagnosis. Shell elongate-conic, yellowish-brown colouration. Peristome thickened, expanded, and reflected. Palatal tubercle weakly developed and blunt. Aperture bearing nine barriers: parietal, infraparietal, angular, upper palatal, lower palatal, suprapalatal, basal, columellar, and subcolumellar. Upper palatal plica very large and strongly curved, forming a broad wing-like structure.

Description. Shell elongate-conical with a high spire, 6¼–6½ widely convex whorls, yellowish-brown to reddish-brown. Apex rather blunt. Protoconch 1½ whorls, generally smooth, without spiral ridges. Teleoconch with relatively strong, widely spaced, irregular transverse striae, and denser, more regular, conspicuous spiral striae. Suture wide and deeply impressed. Last whorl rounded, adnate to the penultimate near the aperture, slightly ascending immediately behind the aperture (~5–10° compared to the shell axis), making the

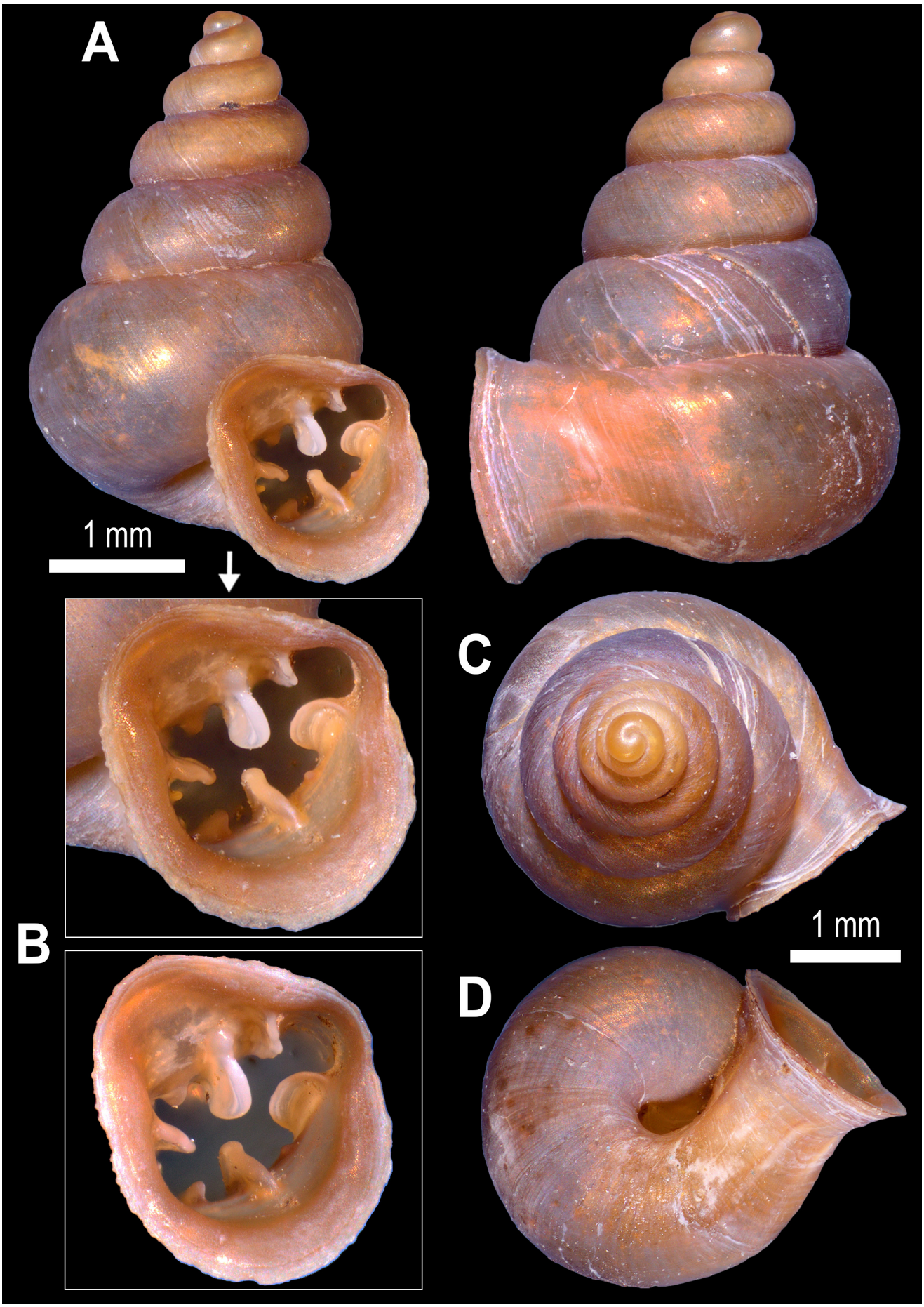

Fig. 1. *Bensonella basaoensis*, new species. A–E, holotype ZVNU.MOL.054 from Tam Chuc, Ninh Binh, Vietnam. A, B, D, E, shell in different views. C, enlarged apertural view.

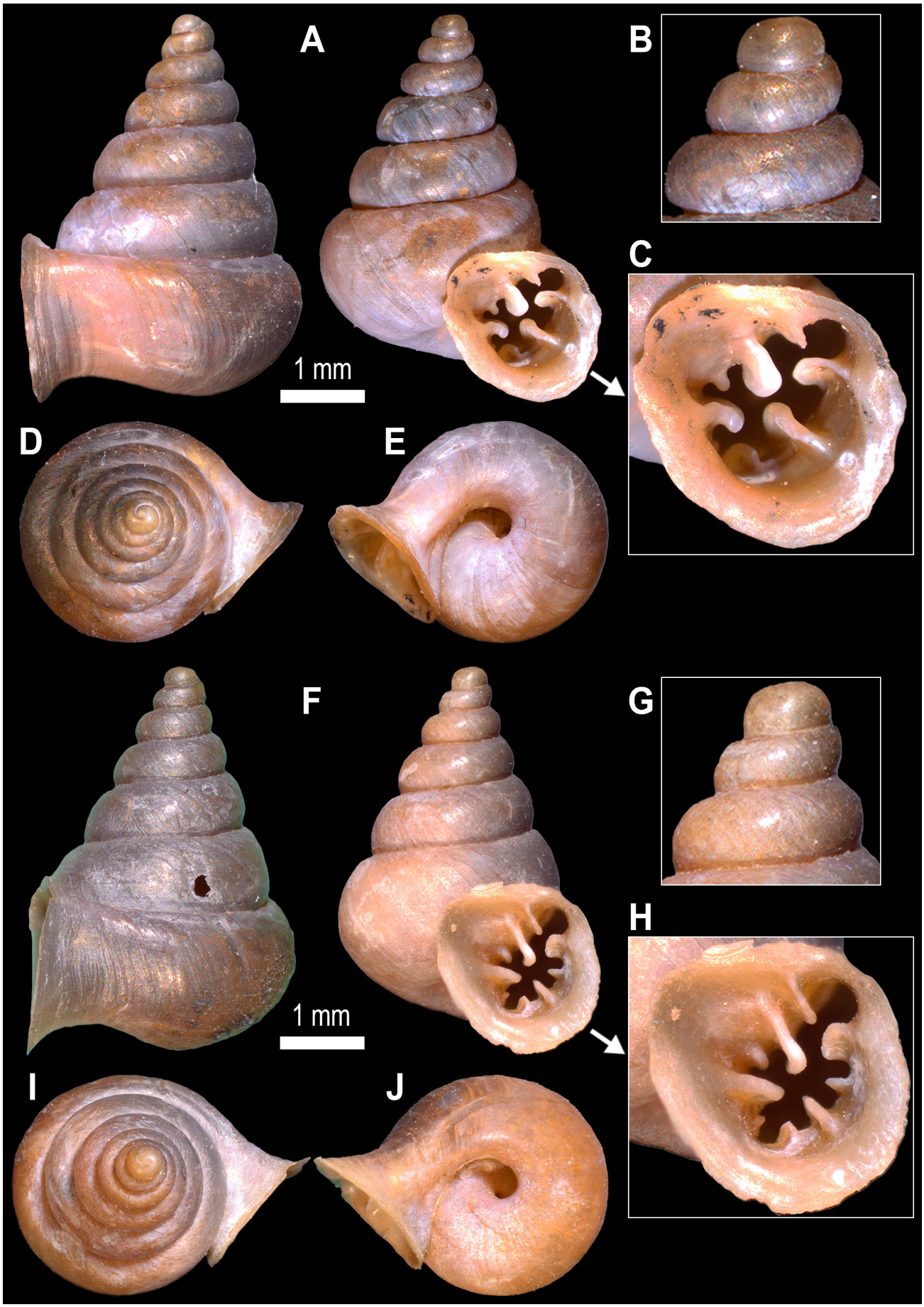

Fig. 2. *Bensonella basaoensis*, new species. A–E, paratype VFM.MOL.0003 from Tam Chuc, Ninh Binh, Vietnam. A, B, D, E, shell in different views. C, enlarged apertural view. F–J, paratype VNMN-IZ 000.002.351 from Ninh Binh, Vietnam. F, G, I, J, shell in different views. H, enlarged apertural view.

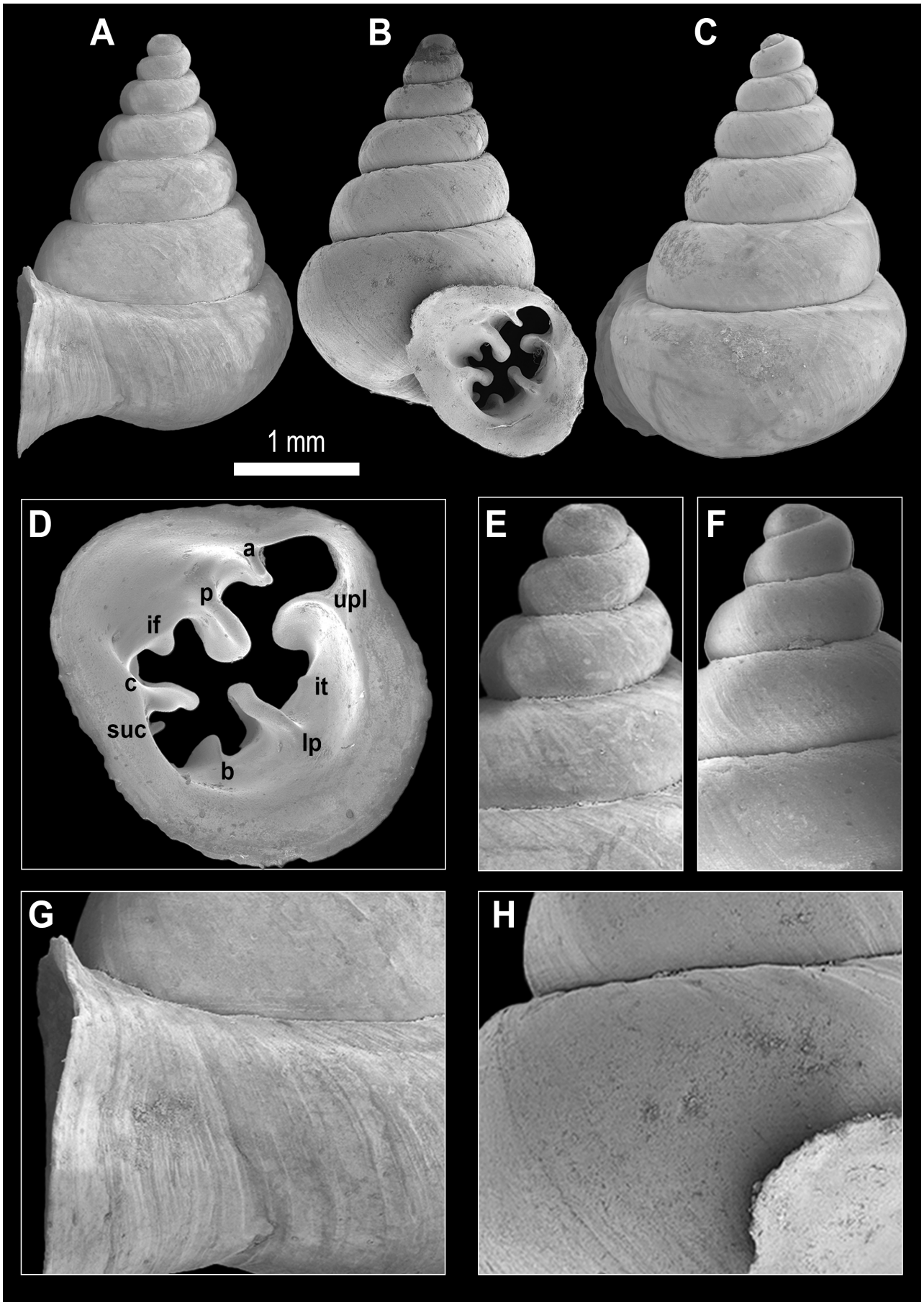

Fig. 3. *Bensonella basaoensis*, new species. A–H, paratype ZVNU.MOL.055 from Tam Chuc, Ninh Binh, Vietnam. A–C, shell in different views. D, enlarged apertural view. E, F, protoconch surface. G, H, teleoconch surface. Abbreviations: a: angular lamella, b: basal plica, c: columellar lamella, if: infraparietal lamella, it: interpalatal plica, lp: lower palatal plica, p: parietal lamella, suc: subcolumellar lamella, upl: upper palatal plica.

apertural profile slightly prosocline. Peristome continuous, thickened, expanded, and reflected; completely axially deflected to the right; attached to preceding whorl, with only the lip separated from the penultimate whorl by a narrow groove. The inner side of the peristome bears a slight sinulus between the angular lamella and the upper palatal plica. Lip straw-yellow to reddish-brown. Cervical crest absent. All nine barriers ivory-white to pale yellow. Parietal lamella very large, strongly developed, elevated, and obtusely triangular in lateral view; directed toward centre of aperture, situated at middle of parietal wall, and reaching peristome. Infraparietal lamella small and weakest among parietal barriers; deeply situated within aperture. Angular lamella thin, semicircular, slightly curved, located higher than parietal lamella. Palatal tubercle weakly developed, blunt, sometimes inconspicuous. Upper palatal plica very large, curved, directed toward basal wall, forming broad wing-like structure. Lower palatal plica relatively large, strong, elevated, semicircular, and directed toward parietal lamella. Interpalatal plicae very small, slightly elevated, and situated deep within aperture. Basal plica prominent, broadly blunt, deeply situated within aperture, and smaller than lower palatal plica. Columellar lamella large, strong, elevated, slightly curved, and nearly horizontal. Subcolumellar lamella quite small, thin, low, and tubercle-like. Umbilicus narrowly perforate, about one-fourth of shell width, rounded, and deep.

Measurements (mm). SH: 4.5–5.1, SW: 3.2–3.5, AH: 1.7–2.1, AW: 1.6–1.9 (n = 18).

Differential diagnosis. *Bensonella paviei* (Bavay & Dautzenberg, 1912) differs from the new species by having smaller size (shell height 1.75 mm, shell width 1.33 mm), 4½ whorls, a prominent palatal tubercle, only two lamellae on the parietal wall, and lacking a basal plica (Gojšina et al., 2025). In contrast, the new species has an elongate-conical shell, larger size (shell height 4.5–5.1 mm, shell width 3.2–3.5 mm), 6¼ to 6½ whorls, a very large upper palatal plica, and generally bears nine apertural barriers. *Bensonella boettgeri* (Möllendorff, 1897) differs from the new species by having smaller size, more triangular and elongate shell, a relatively shallow suture, a distinctly developed palatal tubercle shaped like an obtuse triangle, a strongly developed but uncurved upper palatal plica, and the absence of a basal plica (Pilsbry, 1917). *Bensonella pahpetensis* (Saurin, 1953) can be distinguished from the new species by its smaller shell, a strongly developed obtuse-triangular palatal tubercle, and fewer apertural barriers due to the absence of the angular lamella, upper palatal, interpalatal plica, and subcolumellar lamella. Furthermore, *Bensonella perfecta* Gojšina & Páll-Gergely, 2025 differs from the new species by its smaller size, a more prominent palatal tubercle, and a greater number of apertural barriers. The new species also differs from *Bensonella lakainguta* Hwang, 2014, known from southern Taiwan (China), by having a significantly larger shell with 6¼ to 6½ whorls, a weaker palatal tubercle, and fewer apertural barriers (Gojšina et al., 2025).

Etymology. The specific epithet *basaoensis* refers to Ba Sao Town (formerly part of Kim Bang district, Ha Nam province; currently belonging to Tam Chuc ward, Ninh Binh province), northern Vietnam, which is the type locality where the type specimens were collected.

Distribution. The new species, *Bensonella basaoensis*, is known only from the type locality in Ninh Binh province, northern Vietnam. The snails were found under leaf litter and topsoil in rock crevices of steep limestone karst mountains, where the vegetation had been disturbed.

Remarks. The holotype and paratypes exhibit a thin, curved angular lamella and lack a subangular lamella. However, in one specimen from the same population, the angular lamella is reduced in both height and length, and relatively flat, while a subangular lamella is present as a blunt, small, knob-like structure. Within the restricted habitat where the new species was found, it occurs syntropically with several other land snail species inhabiting the leaf litter and topsoil, including *Cyclotus* sp., *Hypselostoma crossei* (Morlet, 1886), *Gulella bicolor* (Hutton, 1834), *Georissa decora* Möllendorff, 1900, *Aphanoconia hungerfordiana* (Möllendorff, 1882), *Allopeas clavulinum* (Potiez & Michaud, 1838), and *Chalepotaxis infantilis* (Gredler, 1881).

***Bensonella copiaensis*, new species**

(Figs 4, 5, 12B)

Material examined. Holotype ZVNU.MOL. 056 (shell height 2.3 mm, shell width 1.6 mm, 5 whorls; Figs 4A–E, 12B) from a limestone karst in Copia Nature Reserve, Son La province, northwestern Vietnam (21°25′25″N, 103°31′18″E, 1.206 m a.s.l.), leg. D.S. Do, 20 June 2018. Paratypes: ZVNU. MOL. 057 (1 shell, with part of the last whorl missing, Figs 5F–J), VFM.MOL. 0004 (1 shell, with part of the last whorl missing, Figs 5A–E), all collected from the type locality together with the holotype.

Diagnosis. Shell minute, triangular, conical-ovoid, pale yellowish. All eight barriers unhooked. Upper palatal plica well-developed and elevated, closely abutting the palatal tubercle. Columellar lamella large and elongate, obliquely oriented toward the lower palatal plica. Umbilicus narrowly perforate, rounded, dot-like.

Description. Shell triangular, conical-ovoid, high spire, composed of 5–5¼ convex rounded whorls, and pale yellowish. Apex rather blunt. The protoconch consists of approximately 1¼ whorls and lacks spiral striae. Teleoconch dull, without spiral striae, but marked by coarse and irregularly spaced radial growth lines. Suture wide and deeply impressed. Last whorl rounded, adnate to penultimate whorl, and slightly ascending near aperture. Aperture profile slightly oblique relative to shell axis. Peristome thickened, strongly expanded, and reflected, leaning on penultimate whorl, forming a weak, slightly expanded parietal area. Inner side of peristome with small, round, parabolic sinulus, clearly separated from aperture. Peristome opaque white to pale yellow. Cervical crest absent. Aperture subrectangular, with eight barriers, including three lamellae on parietal wall, three plicae on palatal wall, one basal plica, and one

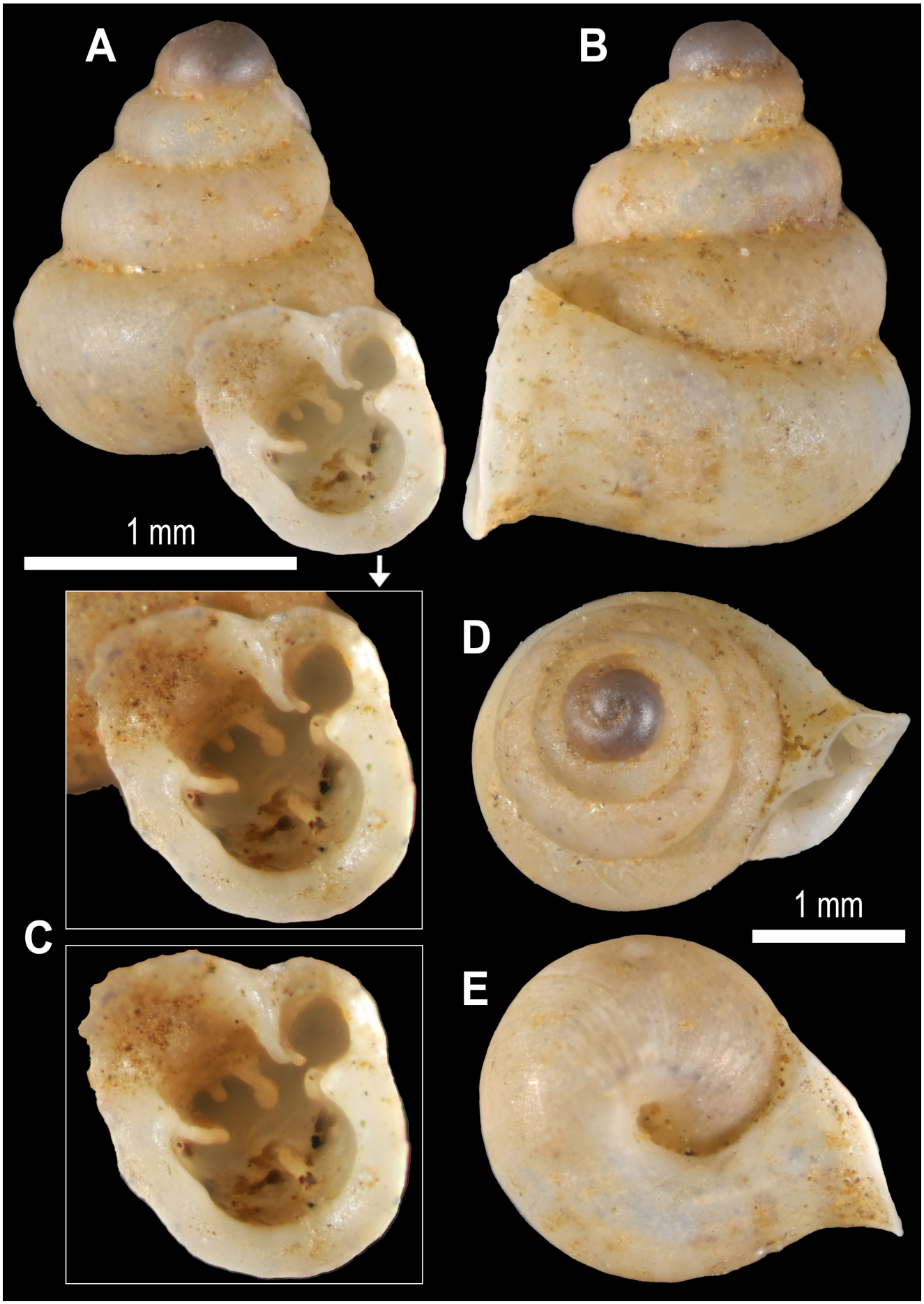

Fig. 4. *Bensonella copiaensis*, new species. A–E, holotype ZVNU.MOL.056 from Copia Nature Reserve, Son La, Vietnam. A, B, D, E, shell in different views. C, enlarged apertural view.

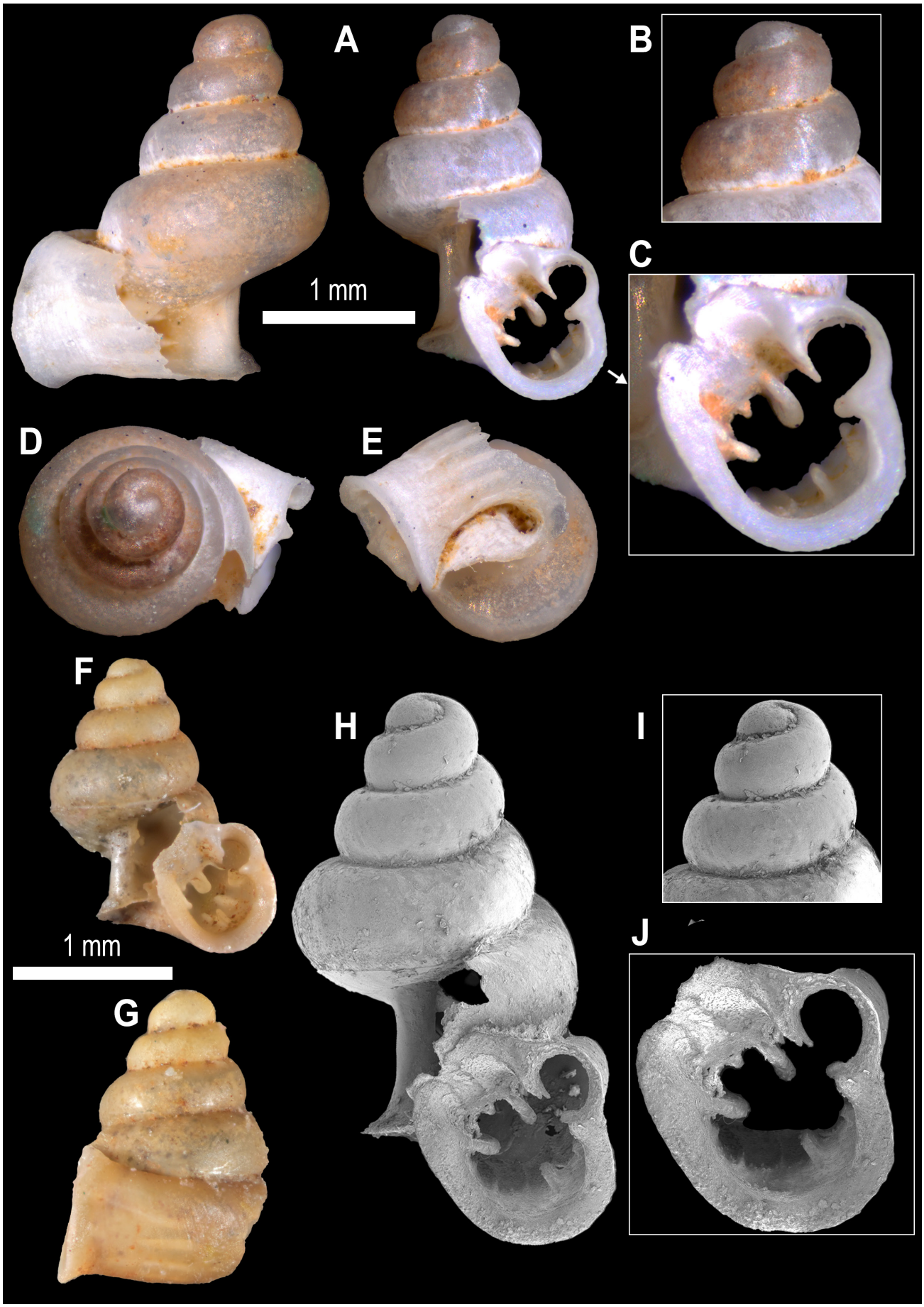

Fig. 5. *Bensonella copiaensis*, new species. A–E, paratype VFM.MOL. 0004 from Co Ma, Son La, Vietnam. A, D, E, shell in different views. B, protoconch surface. C, enlarged apertural view. F–J, paratype ZVNU.MOL. 057 from Son La, Vietnam. F, G, H, shell in different views. I, protoconch surface. J, enlarged apertural view.

columellar lamella. All barriers unhooked, with varying in shape, size, and position. Parietal lamella strong, elevated and blade-like, located deep within aperture. Angular lamella more slender than parietal lamella, extending to expanded peristome; its tip directed toward palatal tubercle. Infraparietal lamella smallest and positioned lowest among the parietal lamellae. No barriers inside sinulus. Palatal tubercle blunt, knob-like, and located anterior to upper palatal plica. Palatal plicae located deep within aperture. Upper palatal plica well-developed, elevated, slightly curved, and closely abutting palatal tubercle. Lower palatal plica appears discontinuous: outer part elevated, triangle-like; inner part longer and scarcely elevated. Infrapalatal plica small and slightly elevated. Basal plica weakly developed, forming thin ridge, situated deep inside aperture. Columellar lamella large, elongate, elevated, and oblique toward lower palatal plica. Umbilicus narrowly perforate, deep, rounded, dot-like.

Measurements (mm)**.** SH: 2.1–2.3, SW: 1.6, AH: 0.7–0.9, AW: 0.6–0.7 (n = 3).

Differential diagnosis. *Bensonella boettgeri* (Möllendorff, 1897) differs from the new species by its triangular, elongated shell and shallow suture; columellar lamella is more weakly developed and oriented horizontally. *Bensonella paviei* (Bavay & Dautzenberg, 1912) resembles the new species in general shell morphology, but differs by its smaller size, presence of a supracolumellar lamella, absence of an infraparietal lamella, a slightly shouldered last whorl, and a wider umbilicus. *Bensonella pahpetensis* (Saurin, 1953) is similar to the new species in shell size and shape, but can be distinguished by having fewer apertural barriers, with the angular and parietal lamellae fused. *Bensonella perfecta* Gojšina & Páll-Gergely, 2025 differs from the new species by its conical shell, larger size (shell height 2.91–3.09, shell width 2.08–2.23), brown colouration, and the presence of four prominent palatal plicae.

Etymology. The species name "*copiaensis*" is derived from the type locality, the Copia Nature Reserve, Son La province, northern Vietnam, where the type specimens were collected. The specific epithet is used as a noun in apposition.

Distribution. The new species, *Bensonella copiaensis*, is known only from the type locality in Copia Nature Reserve, Co Ma commune, Son La province, northwestern Vietnam. The snails were found under leaf litter and topsoil in limestone rock crevices on a steep limestone slope, within a primary forest that remains relatively undisturbed.

Remarks. The new species exhibits some variability in shell size, apertural barriers, and peristome, although only three specimens have been discovered. Compared to two paratypes, basal plica of holotype is weaker developed and not easily observed. Additionally, a blunt, tubercle-like projection is present on columellar wall, situated immediately above columellar lamella (see Figs 4, 5).

***Bensonella expansa*, new species**
(Figs 6–8, 12C)

Material examined. Holotype ZVNU.MOL. 058 (shell height 3.0 mm, shell width 1.7 mm, 6 whorls; Figs 6A–E, 12C) from limestone area in Nam Phan commune, Khoune district, Xieng Khouang province, northeast Laos (19°31′59″N, 103°31′01″E), leg. C. Vilachark, 26 July 2018. Paratypes: ZRC.MOL.35093 (2 shells), ZVNU.MOL. 059 (4 shells; Figs 7F–J), VNMN-IZ 000.002.352 (2 shells), VFM. MOL. 0005 (2 shells; Figs 7A–E; Figs 8A–D), all collected from the type locality together with the holotype.

Diagnosis. Shell triangular-conical, brownish yellow. Peristome white, thickened, strongly expanded. Angular lamella very large, reaching peristome. Numerous coloured stripes resembling ivory-white threads present on angular, parietal, upper palatal, and columellar lamellae. Lower palatal, interpalatal, basal, and subcolumellar barriers similar in size and shape, evenly spaced.

Description. Shell triangular-conical with high spire, consisting of 5 regularly increasing, rounded whorls, pale yellowish to brownish yellow. Apex rather blunt. Protoconch consisting of 1½ whorls, same colour as shell, faintly pitted, pasty, showing no spiral pattern. Teleoconch with fine, matte surface sculpture and coarse, irregularly spaced radial growth lines. Suture wide and deeply impressed. Last whorl adnate to penultimate whorl near aperture, ascending immediately behind the aperture (~ 5–10° compared to shell axis), making apertural profile slightly prosocline. Peristome white, opaque, distinct, thickened, strongly expanded, and reflected; mostly continuous, partially separated from penultimate whorl by a very narrow groove; in some specimens, forming thick parietal callus. Palatal wall elevated at centre and gradually lowering toward both tips (in lateral view); upper part expanded outward in an arc shape, forming a broad, rounded sinulus inside aperture, clearly separated from rest of aperture; lower part almost straight. Cervical crest absent. Palatal tubercle moderately strong, with blunt apex and broadly swollen base, corresponding to shallow external depression. Aperture fairly large, strongly oblique to shell axis, forming two separate cavities: sinulus almost completely closed and remaining rectangular cavity. Aperture subrectangular, with nine barriers, including angular, parietal, infraparietal, upper palatal, lower palatal, interpalatal, basal, columellar, and supracolumellar. All barriers unhooked, variable in shape and size. Angular lamella prominent, largest among barriers, highly elevated, reaching peristome and extending deep into aperture. Parietal lamella strong, blade-like, deeply placed in aperture. Infraparietal lamella similar to parietal lamella in shape, but smaller and situated deeper. Upper palatal plica relatively long, elevated, and slightly sinuous. Lower palatal, interpalatal, basal plicae, and subcolumellar lamella similar in size and shape, long, slender, slightly elevated, and evenly spaced. Columellar lamella relatively strong, blade-like, situated similarly to infraparietal lamella. Umbilicus narrow, relatively deep, measuring about one-fifth of shell width.

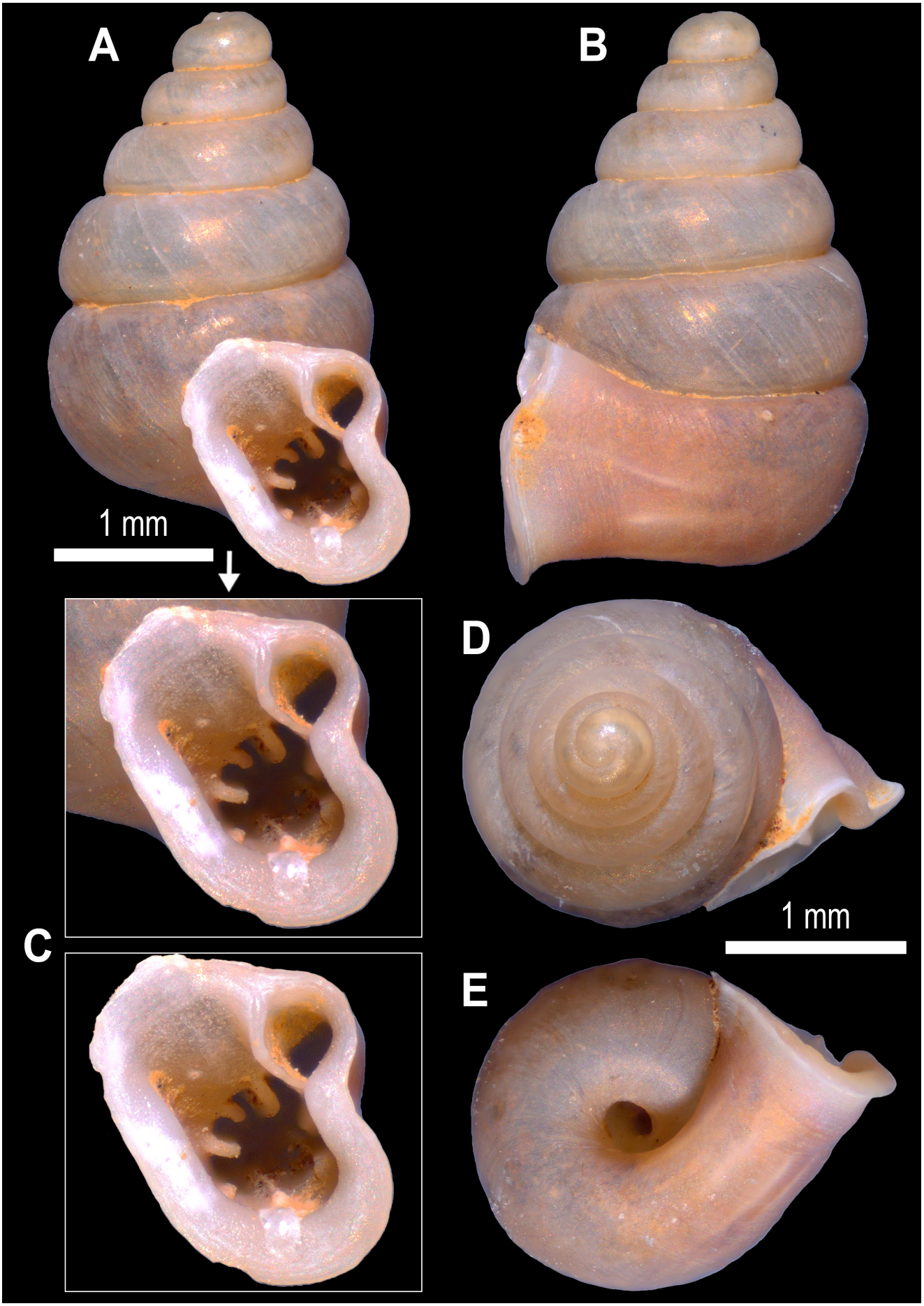

Fig. 6. *Bensonella expansa*, new species. A–E, holotype ZVNU.MOL.058 from Nam Phan, Khoune, Xieng Khouang, Laos. A, B, D, E, shell in different views. C, enlarged apertural view.

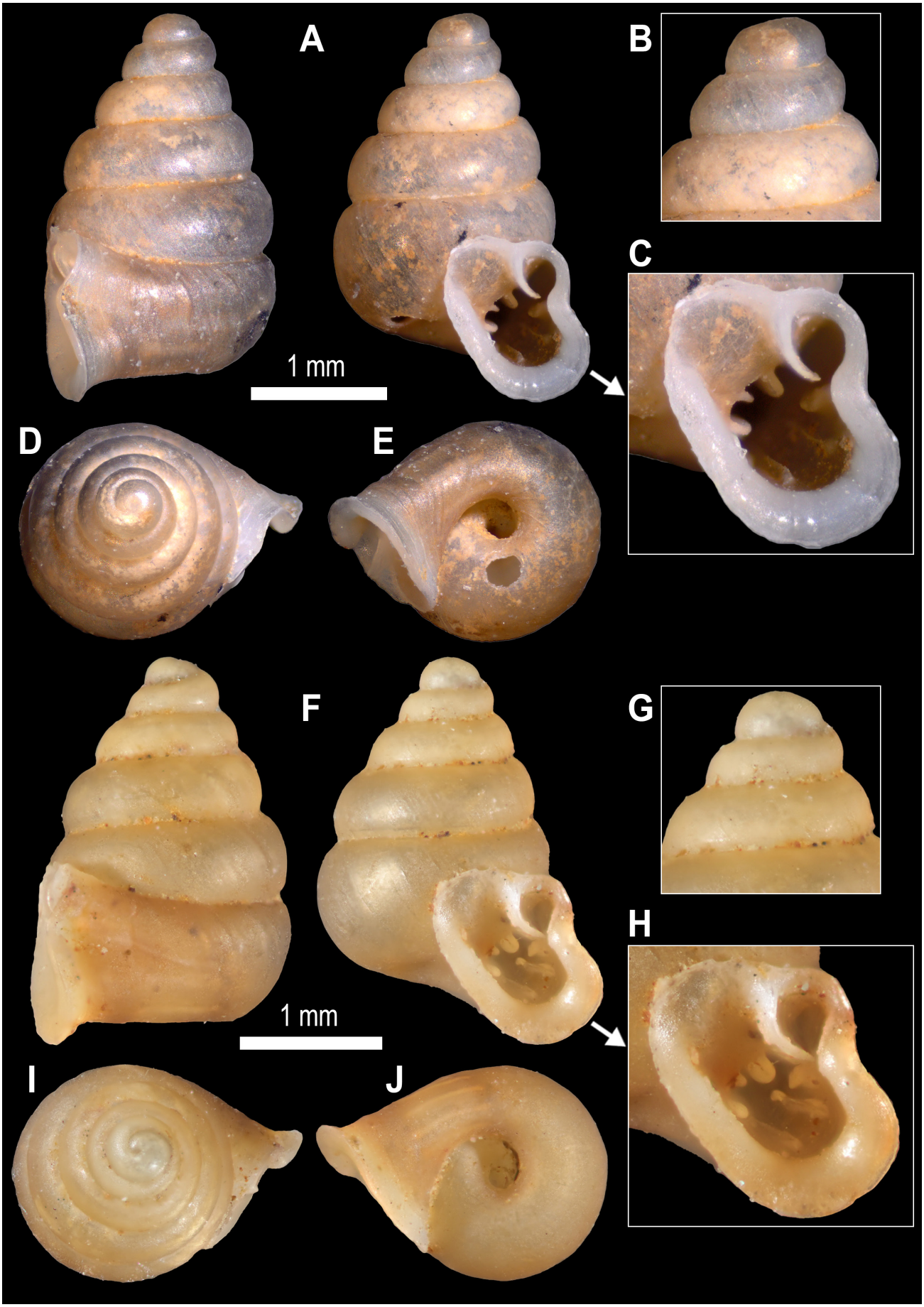

Fig. 7. *Bensonella expansa*, new species. A–E, paratype VFM.MOL.0005 from Khoune, Xieng Khouang, Laos. A, D, E, shell in different views. B, protoconch surface. C, enlarged apertural view. F–J, paratype ZVNU. MOL. 059 from Khoune, Xieng Khouang, Laos. F, I, J, shell in different views. G, protoconch surface. H, enlarged apertural view.

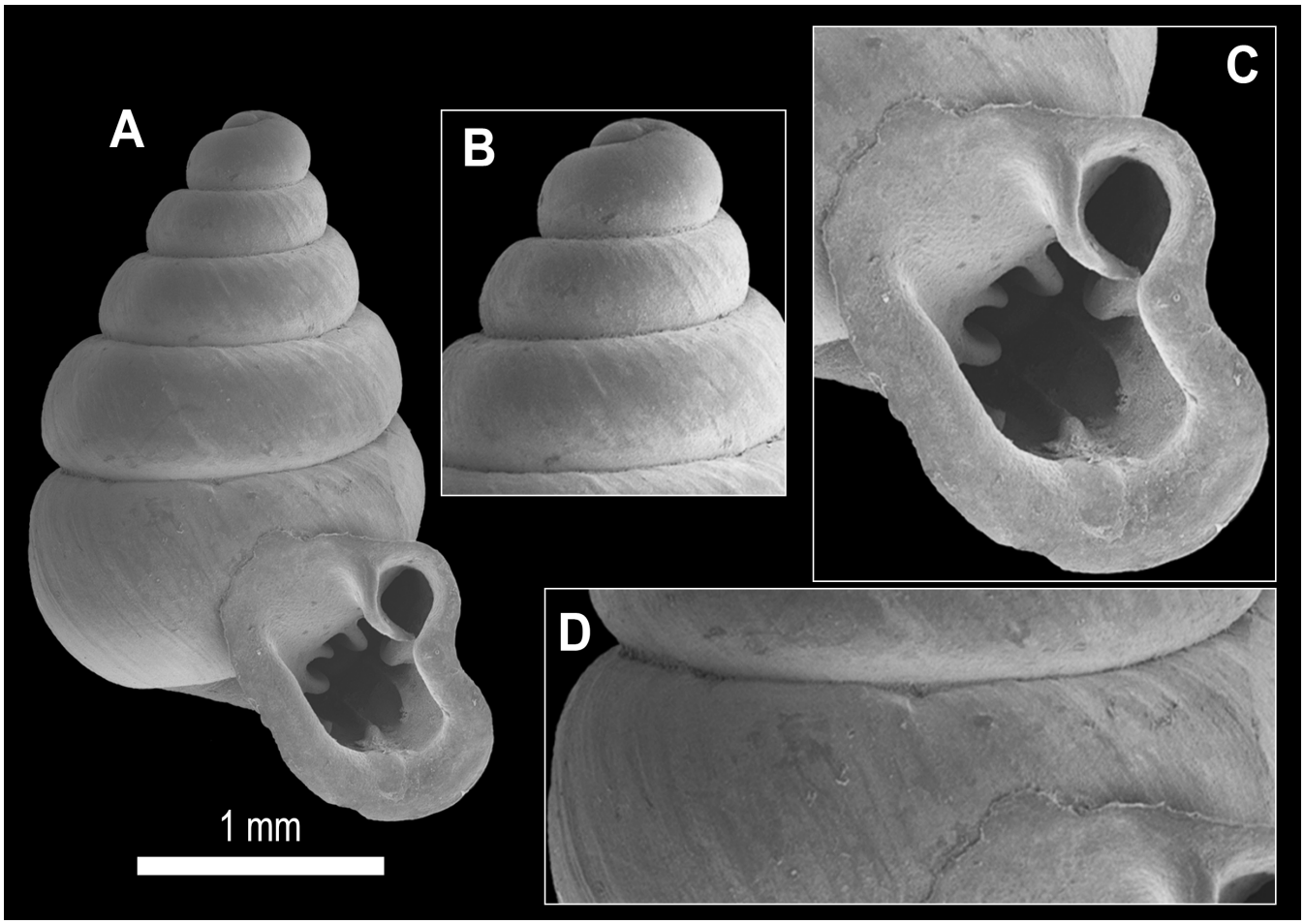

Fig. 8. *Bensonella expansa*, new species. A–D, paratype VFM.MOL.0005 from Khoune, Xieng Khouang, Laos. A, shell in apertural view. B, protoconch surface. C, enlarged apertural view. D, teleoconch surface.

Measurements (mm). SH: 2.6–3.0, SW: 1.5–1.8, AH: 1.0–1.2, AW: 0.9–1.0 (n = 11).

Differential diagnosis. *Bensonella boettgeri* is similar to *B. expansa*, new species, in general shell morphology and obliquely oriented aperture, but differs by its triangular, elongated shell, flattened whorls separated by a shallow suture, variable shell colouration ranging from pale yellow to purplish brown, a very large and elevated parietal lamella located closer to the peristome, and fewer palatal plicae. *Bensonella pahpetensis* differs from the new species by its smaller shell size and the presence of fused angular and parietal lamellae forming a concrescent barrier. *Bensonella paviei* can be distinguished from *Bensonella expansa*, new species, by its smaller shell size, less expanded peristome, and a more prominent, elevated lower palatal plica positioned closer to the peristome. *Bensonella perfecta* can be distinguished from the new species by its conical shell, brown colouration, subsquare aperture, and the presence of four palatal plicae that are equally developed and evenly spaced.

Etymology. The specific epithet '*expansa*' is derived from the Latin word 'expansus', meaning 'expanded or spread out', referring to the notably expanded peristome (lip) of the new species.

Distribution. The new species, *B. expansa*, is known only from the type locality in Xieng Khouang province, northeast Laos. The snails were found beneath accumulations of leaf litter retained in limestone cavities at the base of limestone hills, where primary forest showed signs of degradation.

Remarks. This species exhibits low intraspecific diversity, with most shell characters remaining stable. In a few specimens, shell colouration fades to pale yellow or dull, likely due to long-term weathering under natural conditions.

***Bensonella magnisinulosa*, new species**

(Figs 9–11, 12D)

Material examined. Holotype ZVNU.MOL. 060 (shell height 4.0 mm, shell width 2.7 mm, 6 whorls; Figs 9A–E) from an isolated limestone hill in Thanh Yen commune, Dien Bien province, northwestern Vietnam (21°15′35″N, 102°51′08″E, 785 m a.s.l.), leg. D.S. Do & C. Vilachark, 08 December 2018. Paratypes: ZRC.MOL.35094 (2 shells), ZVNU.MOL. 061 (5 shells; Figs 10F–J, 11A–D), VFM. MOL. 0006 (2 shells; Figs 10A–E), all collected from the type locality together with the holotype.

Diagnosis. Shell triangular-conical, pale yellowish. Aperture with two distinct cavities: subcircular sinulus and ~~a~~ rectangular remaining cavity. Angular lamella strong,

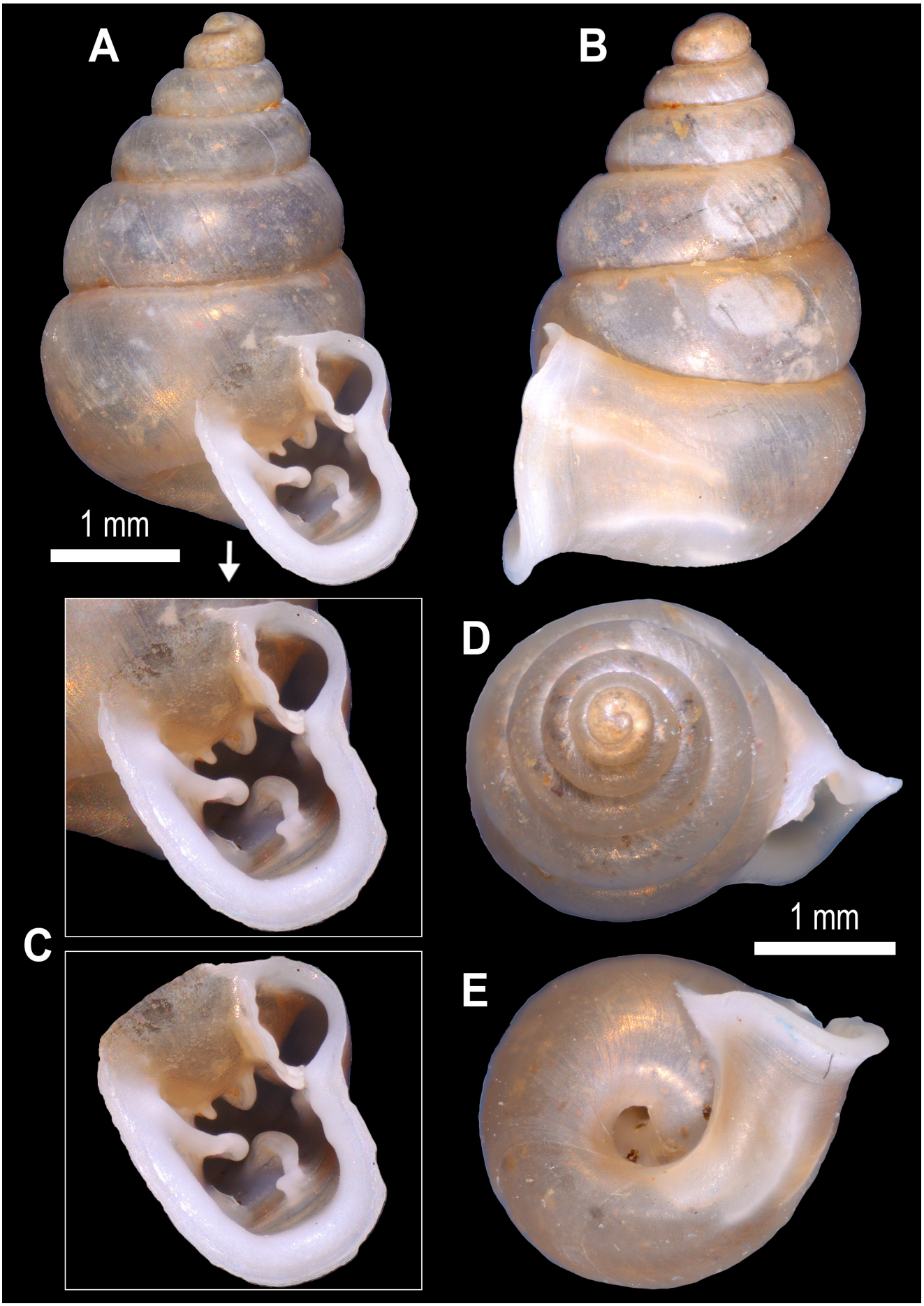

Fig. 9. *Bensonella magnisinulosa*, new species. A–E, holotype ZVNU.MOL.060 from Thanh Yen, Dien Bien, Vietnam. A, B, D, E, shell in different views. C, enlarged apertural view.

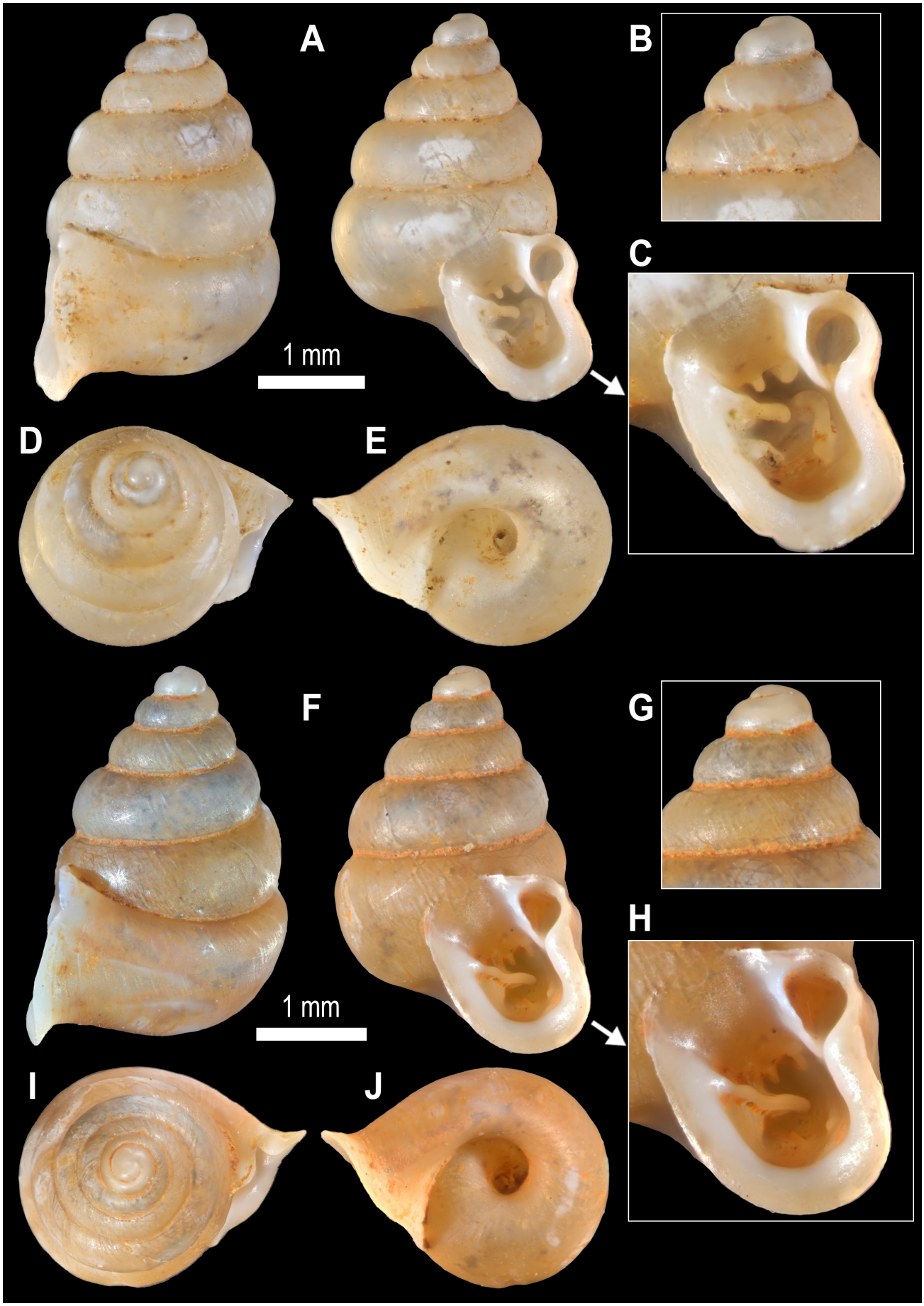

Fig. 10. *Bensonella magnisinulosa*, new species. A–E, paratype VFM.MOL.0006 from Thanh Yen, Dien Bien, Vietnam. A, D, E, shell in different views. B, protoconch surface. C, enlarged apertural view. F–J, paratype ZVNU.MOL. 061 from Dien Bien, Vietnam. F, I, J, shell in different views. G, protoconch surface. H, enlarged apertural view.

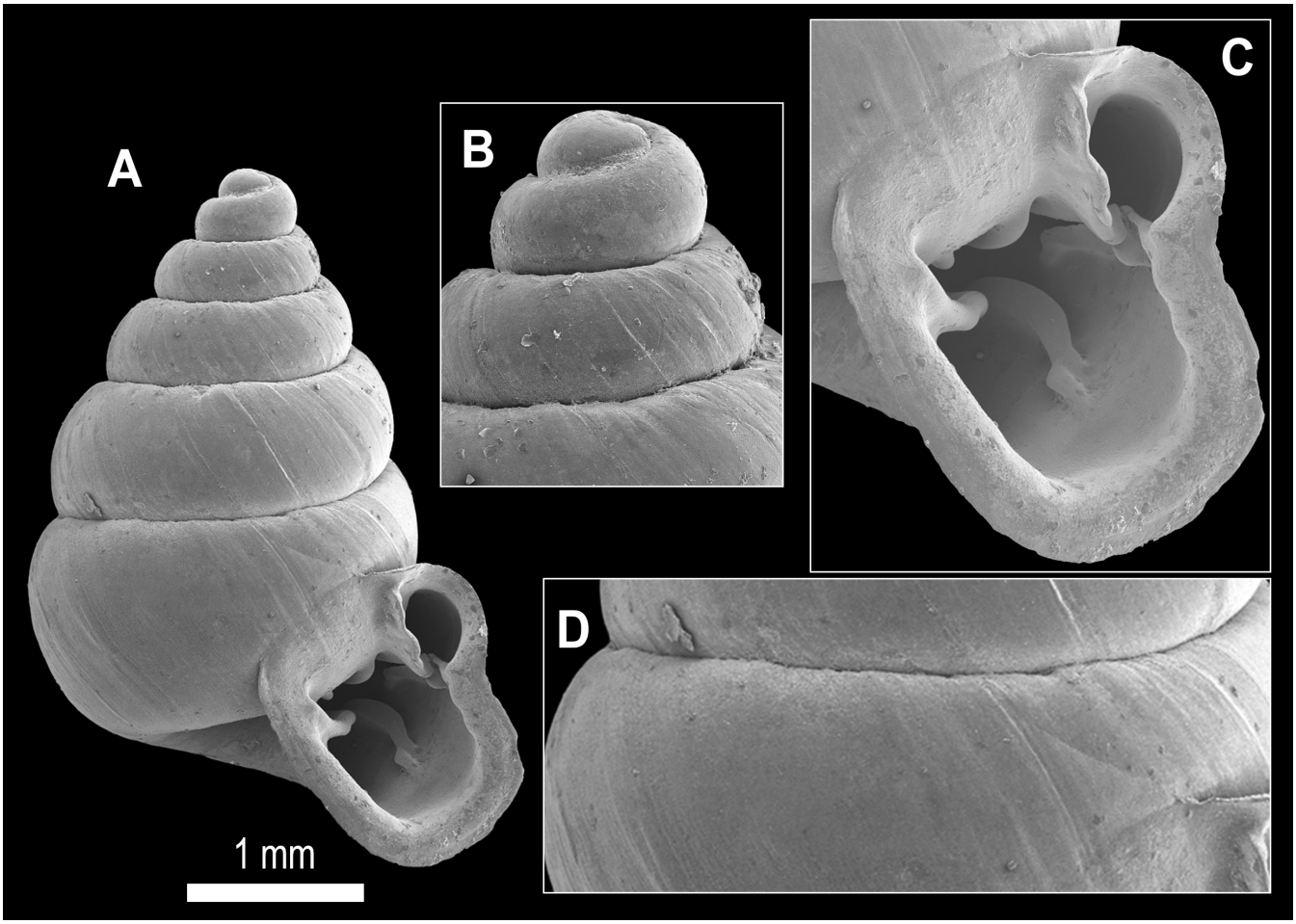

Fig. 11. *Bensonella magnisinulosa*, new species. A–H, paratype ZVNU.MOL. 061 from Thanh Yen, Dien Bien, Vietnam. A, shell in apertural view. B, protoconch surface. C, enlarged apertural view. D, teleoconch surface.

distinctly elevated, reaching peristome and twisted. Both palatal plicae strong, elevated, long, and curved.

Description. Shell triangular-conical with high spire, consisting of 5¾–6 regularly increasing, rounded whorls, pale yellowish. Apex rather blunt. Protoconch 1½ whorls, same colour as shell, and rather smooth. Teleoconch with fine dimpling and coarse, irregularly spaced radial growth lines, lacking spiral striae. Suture broad and relatively shallow. Last whorl rounded, adnate to penultimate whorl near aperture, tapering in lower half, and slightly ascending immediately behind aperture (~5–10° relative to the shell axis), making aperture profile slightly prosocline. Peristome thickened, strongly expanded and reflected; discontinuous due to incompletely developed parietal wall. Upper part of palatal wall expanded outward in a reversed C-shape, lower part almost straight. Peristome ivory to pale yellow. Cervical crest absent. Palatal tubercle relatively strong and blunt, corresponding to shallow external depression. Aperture large, vertically oriented, with two distinct cavities: semilunar sinulus and rectangular remaining cavity. Seven apertural barriers ivory-white to pale yellow, showing variation in shape, size, and position, including: angular, parietal, infraparietal, upper palatal, lower palatal, basal, and columellar. Parietal lamella strong, blade-like, deeply placed, directed toward centre of the aperture. Angular lamella strong, distinctly elevated above aperture profile, reaching peristome and twisted. Infraparietal lamella also blade-like, but smaller and lower than parietal lamella. Both palatal plicae very large and conspicuous; upper palatal plica slightly curved and reaching palatal tubercle; lower palatal plica elongated, elevated, deeply situated within aperture, proximal end sometimes beak-like. Basal plica long and slender, slightly elevated, situated deepest among aperture barriers. Columellar lamella very strong, elongate, oblique, reaching peristome, with midportion markedly elevated. Umbilicus slightly narrow but relatively deep, measuring about one-fourth of shell width.

Measurements (mm)**.** SH: 3.4–4.0, SW: 2.4–2.7, AH: 1.2–1.5, AW: 1.1–1.2 (n = 10).

Differential diagnosis. *Bensonella boettgeri* is similar to *B. magnisinulosa*, new species, in general shell morphology, with a very high spire and an aperture oblique to shell axis, but differs in its smaller size, continuous peristome, and significantly less developed angular lamella. *Bensonella pahpetensis* differs from the new species by its smaller shell size and fewer apertural barriers, with fused angular and parietal lamellae. *B. paviei* differs from the new species by its smaller size, a slightly shouldered last whorl, presence of a supracolumellar lamella, but lacks an infraparietal lamella. *B. perfecta* differs from the new species by its conical shell, smaller size, brown colouration, presence of a distinct palatal

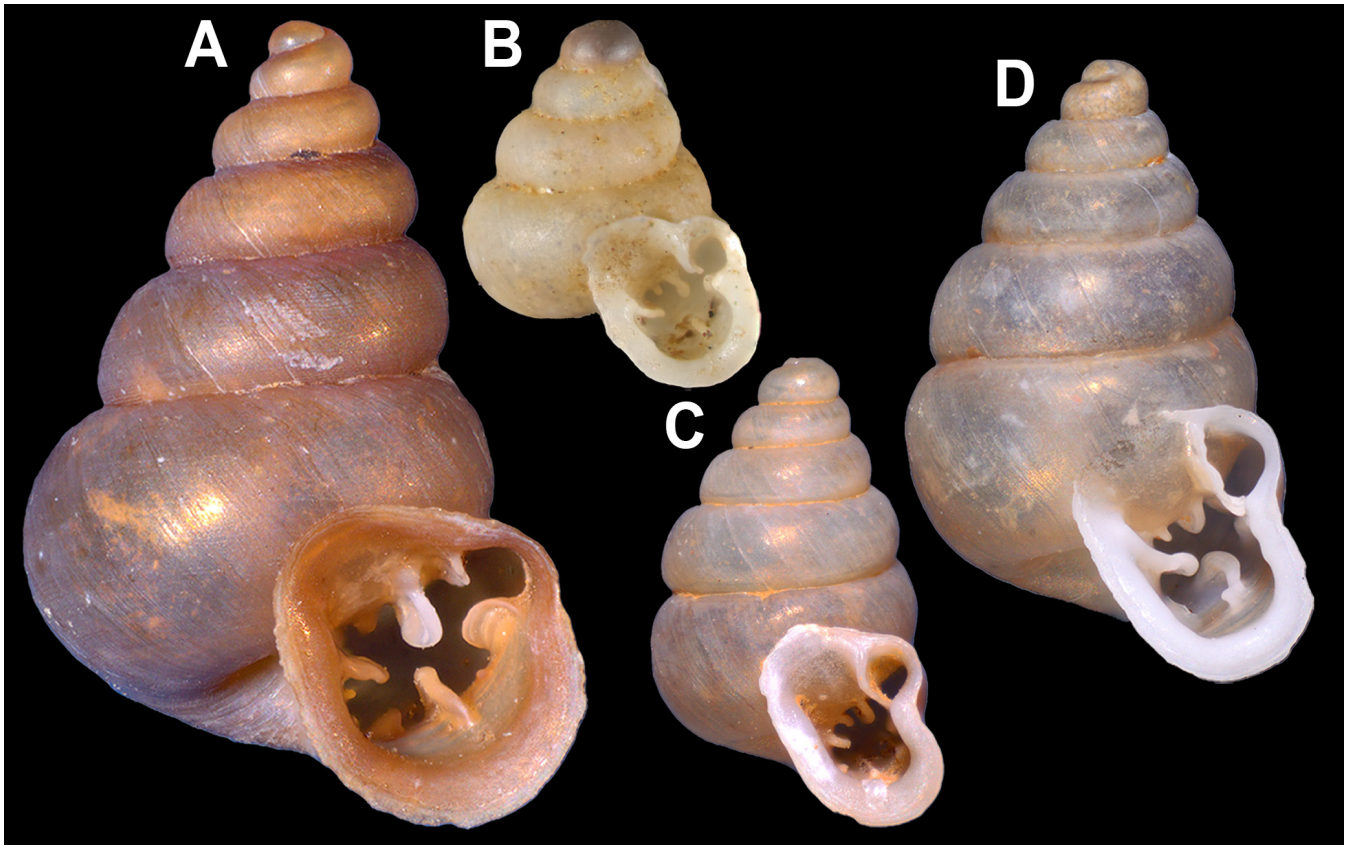

Fig. 12. Synoptic view of four new *Bensonella* species from Laos and Vietnam. A, *Bensonella basaoensis*, new species, holotype ZVNU.MOL.054. B, *Bensonella copiaensis*, new species, holotype ZVNU.MOL.056. C, *Bensonella expansa*, new species, holotype ZVNU.MOL.058. D, *Bensonella magnisinulosa*, new species, holotype ZVNU.MOL.060.

tubercle, and more numerous apertural barriers, including four evenly spaced palatal plicae.

Etymology. The specific epithet '*magnisinulosa*' is derived from the Latin adjective 'magnus-', meaning "large", and 'sinulosus', referring to the large and prominent sinulus that is distinctly separated from the rest of the aperture.

Distribution. The new species, *B. magnisinulosa*, is known only from the type locality in Thanh Yen commune, Dien Bien province, northwestern Vietnam. The snails were found beneath leaf litter and topsoil on the limestone cliffs of an isolated limestone hill with degraded primary forest. Residents have converted some areas at the base of the hill into small-scale vegetable and maize cultivation.

Remarks. The new species exhibits considerable variation in shell size, peristome colouration, and the morphology of apertural barriers, particularly the angular lamella and the columellar lamella. In most specimens, the angular lamella is prominently raised and nearly reaches the upper palatal plica, while in others, a narrow gap separates these two barriers (see Figs. 9–11).

DISCUSSION

Gojsina et al. (2025) previously recorded seven species of *Bensonella* from Laos and Vietnam, namely *B. boettgeri* (Möllendorff, 1897), *B. cardiostoma* Gojšina, Vermeulen & Páll-Gergely, 2025, *B. mitochondria* Gojšina, Vermeulen & Páll-Gergely, 2025, *B. pahpetensis* (Saurin, 1953), *B. paviei* (Bavay & Dautzenberg, 1912), *B. perfecta* Gojšina & Páll-Gergely, 2025, and *B. wangviangensis* (Panha & Tongkerd, 2003). Our study adds four new species, which are all restricted to limestone areas.

Among all species known from Laos and Vietnam, nine species (82%) are only known from the type localities or have narrow or highly restricted ranges, i.e., *Bensonella basaoensis*, new species, *B. cardiostoma*, *B. copiaensis*, new species, *B. expansa*, new species, *B. magnisinulosa*, new species, *B. mitochondria*, *B. pahpetensis*, *B. perfecta*, and *B. wangviangensis*, while only two species (18%) are widespread, i.e., *Bensonella boettgeri* and *B. paviei*. These results reflect the general pattern for *Bensonella*. Overall, 41 species of *Bensonella* have been recorded (MolluscaBase, 2025; Gojšina et al., 2025), with 38 species, accounting for 93% of the known species, being known from type localities or only from a few nearby sites (Gojšina et al., 2025; this study).

In Vietnam, limestone environments (the primary habitat of *Bensonella*) cover nearly 20% of the national land area (approximately 60,000 km²), with the highest concentrations in the northern region, notably in Phu Tho, Cao Bang, Lang Son, and Tuyen Quang provinces (Tran et al., 2005; Sterling et al., 2008). In Laos, extensive limestone regions

are primarily distributed across the northern and central parts, particularly in Khammouane, Xieng Khouang, Luang Prabang, and Houaphanh provinces (Clements et al., 2006; Inkhavilay et al., 2016, 2019). Many of these areas remain largely underexplored in terms of biodiversity. The limestone karst systems of both countries, developed under humid tropical climates, exhibit high levels of habitat heterogeneity and ecological isolation, conditions likely to promote micro-allopatric diversification in terrestrial microsnails such as *Bensonella*. These natural features highlight the considerable potential for undiscovered land snail diversity in the Indochinese limestone region, which could be revealed through comprehensive, locality-focused surveys.

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