

## Two new dextral subspecies of *Alopia* H. & A. Adams 1855 (Gastropoda: Clausiliidae)

T. Deli & M. Szekeres

**Abstract:** *Alopia glorifica deceptans* subsp. nov. (Romania, Piatra Craiului Mts., Valea Seacă Pietrelor) and *A. grossuana nemethi* subsp. nov. (Romania, Vâlcan Mts., Valea Sohodol) are described as new taxa. The two dextral subspecies are enantiomorphic pairs of the contiguously occurring sinistral *A. glorifica intercedens* (A. Schmidt) and *A. grossuana grossuana* Nordsieck, respectively. The geographical distribution patterns and taxonomic positions of the new *Alopia* forms are discussed.

**Keywords:** Clausiliidae, *Alopia*, enantiomorphic taxa, taxonomy, Romania.

One particularly intriguing feature of the genus *Alopia* is the existence of multiple enantiomorphic taxon pairs: sinistral and dextral forms without any other apparent morphological differences, occurring in separate but neighbouring ranges (Bielz, E. A. 1861; Kimakowicz, M. 1894; Wagner, A. J. 1914; Soós, L. 1943). During the investigation of such enantiomorphic taxa, two hitherto undescribed subspecies were discovered, which represent dextral chiral morphs of already known sinistral taxa. The two new subspecies described here proved valuable tools for investigating the phylogenetic relationship between mirror-symmetric taxa, as well as evolutionary conservation of chirality, in *Alopia*.

Type material of the new subspecies has been deposited at the following public collections: Field Museum of Natural History, Chicago (FMNH); Florida Museum of Natural History, Gainesville (UF); Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main (SMF); Haus der Natur, Cismar (HNC); Hungarian Natural History Museum, Budapest (HNHM); Mátra Múzeum, Gyöngyös (MMG); Munkácsy Mihály Múzeum, Békéscsaba (MMMB); Muzeul de Istorie Naturală, Sibiu (MINS); Natural History Museum, London (NHMUK); Naturhistorisches Museum, Wien (NHMW); Zoologische Staatssammlung, München (ZSM). Paratypes are also held in the private collections of Éva Horváth (HO, Kardoskút), József Lennert (LE, Békéscsaba), László Németh (NE, Budapest), Barna Páll-Gergely (PA, Mosonmagyaróvár), Péter Subai (SU, Aachen), and Miklós Szekeres (Szeged).

Systematic part  
Alopiinae

### *Alopia glorifica deceptans* subsp. nov.

Figure 1 a-c

Diagnosis: A dextral subspecies, which is morphologically indistinguishable from the indistinctly costate form of the sinistral *A. glorifica intercedens* (A. Schmidt, 1857). The shell differs from those of the nearby occurring *A. lischkeana lischkeana* (Charpentier, 1852) and *A. l. livens* (E. A. Bielz, 1853) by the more elongated shape and the stronger sculpture, respectively.

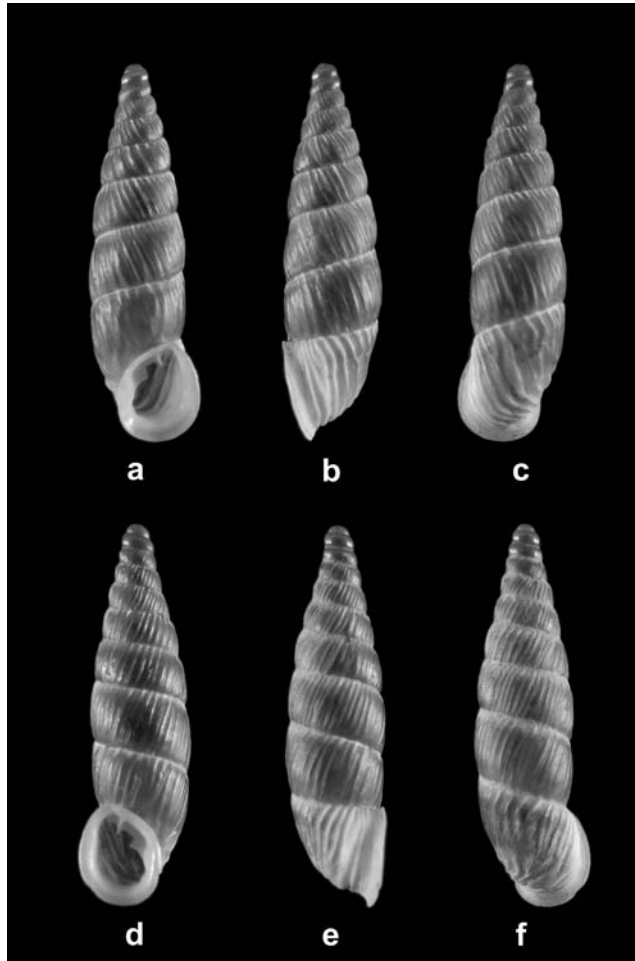


Figure 1. a-c: *Alopia glorifica deceptans* subsp. nov., holotype (HNHM 97423), H: 15.4 mm; d-f: *Alopia glorifica intercedens* (A. Schmidt), Valea Seacă Pietrelor 2.5 km N of Cabana Brusturet, 1200 m.

Type material: Romania, Piatra Craiului Mts., both sides of Valea Seacă Pietrelor 2 km N of Cabana Brusturet, 1150 m, L. Németh leg., 2–3/9/2005. Holotype HNHM 97423, paratypes MMB 91918/2, NHMUK 20110206/2, FMNH/2, HNC/2, HNHM 97424/2, MINS/2, MMG 70000/2, NHMW 108102/2, SMF 336542/2, UF/2, ZSM Mol/2, NE/690, SZ/6. Further paratypes from the same locality (A. Nicoara leg., 17/7/2004): SZ/2.

Description: The dextral shell of  $8\frac{3}{4}$  to  $10\frac{1}{2}$  whorls has purplish-corneous colour with opalescent surface. The apex is strongly and regularly costate, but toward the last two whorls the ribs become flattened, diffuse and irregular, resulting in an undulate surface. The whorls are well emerged, toward the basis they become separated by a white sutural strip. At the whitish neck region the ribs are sharper, denser and more regular. The basis is rounded, with inconspicuous basal crest.

The relatively large, ovoidal aperture has wide, white margin with a light brownish tint. The upper margin is usually free, less frequently becomes fused to the adjacent whorl. The moderately developed lamella superior is sharp and short. Its inner end is widely separated from the weakly emerged lamella spiralis. The lamella inferior of medium strength is positioned high in the aperture. Underneath, the outer end of the lamella subcolumellaris is usually visible in front view. The short plica principalis is only about a quarter of a whorl long. Dorsally, under its inner end, a short upper palatal fold is present. The basal fold is mostly diffuse. Between the upper and basal folds the remnants of other palatal plicae become fused to a weak, lunella-like structure. The clausilium is partially reduced, its inner and outer lobes form a rectangular shoulder.

Shell height: 14.4 to 17.7 mm, shell width: 3.6 to 4.2 mm, aperture height: 3.4 to 4.2 mm, aperture width: 2.8 to 3.4 mm.

Etymology: The name refers to the deceptive similarity between the shells of the new subspecies and those of *A. l. lischkeana* (Charpentier) and *A. l. livens* (E.A. Bielz).

Remarks: Morphologically this clausiliid is the dextral equivalent of an inconspicuously-ribbed form of the sinistral *A. g. intercedens* (Figure 1 d-f). We classify *A. g. deceptans* subsp. nov. as a subspecies because it has a distribution range distinct from that of *A. g. intercedens*. The new subspecies occurs at the lowest section of the Seacă Pietrelor Valley, whereas *A. g. intercedens* was found farther upstream. In a narrow transition zone between the two ranges the sinistral and dextral forms live sympatrically.

The Piatra Craiului Mts. is inhabited by numerous subspecies of the morphologically similar *A. glorifica* (Charpentier, 1852) and *A. lischkeana* (Charpentier). According to recent molecular phylogenetic analyses, these two species are not closely related (Z. Fehér, L. Németh, A. Nicoara & M. Szekeres, unpublished results). Therefore, despite the superficial resemblance, *A. g. deceptans* subsp. nov. belongs to an evolutionary lineage entirely distinct from that of the morphologically similar *A. l. lischkeana* and *A. l. livens*.

#### ***Alopi grossuana nemethi* subsp. nov.**

Figure 2 a-c

Diagnosis: A dextral subspecies, which is otherwise morphologically indistinguishable from the sinistral nominate subspecies of *A. grossuana* Nordsieck, 1977.

Type material: Romania, Vâlcan Mts., left side of Valea Sohodol, cave 8 km N of the valley entrance (45°10'47.0" N 23°7'58.1" E), 450 m, T. Deli, P. Subai, M. Szekeres leg., 23/5/2009. Holotype NHNM 97421, paratypes SZ/11. Further paratypes from the same locality (L. Németh leg., 1–2/7/2007): NE/690, SZ/6; (T. Deli leg., 6/7/2007): MMBB 91919/4, SZ/4; (T. Deli, É. Horváth, J. Lennert, B. Páll-Gergely, P. Subai leg., 3/5/2008): NHMUK 20110207/2, FMNH/2, HNC/2, NHNM 97422/2, MINS/2, MMG 70001/2, MMBB 91920/15, NHMW 108103/2, SMF 336543/2, UF/2, ZSM Mol/2, HO/15, LE/15, PA/15, SU 22435/44, SZ/8.

Description: The glossy, ochre-coloured shell consists of  $8\frac{2}{3}$  to  $10\frac{1}{2}$  whorls. Except for some irregular and widely spaced sutural papillae at the apical part, the surface of the whorls is almost entirely smooth. The moderately emerged teleconch whorls are separated by a whitish sutural band. The lighter coloured neck is diffusely wrinkled, with a few weak but sharp ribs developing behind the peristome. The basis is rounded, with weak basal crest.

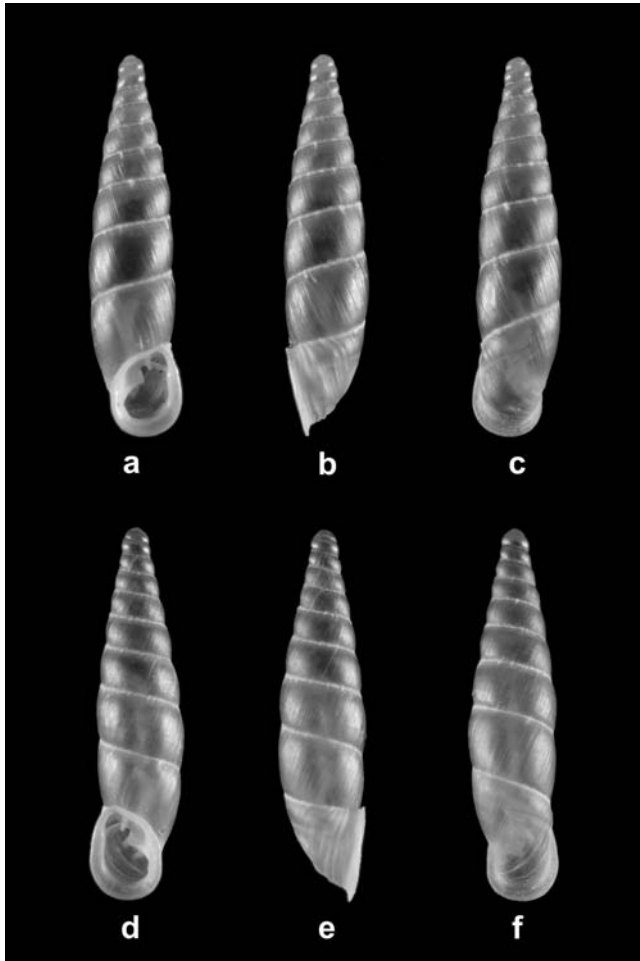


Figure 2. a-c: *Alopia grossuana nemethi* subsp. nov., holotype (HNHM 97421), H: 18.0 mm; d-f: *Alopia grossuana grossuana* Nordsieck, Valea Sohodol 2 km N of Runcu, 380 m.

The aperture is elongated ovoidal, with light brownish-white margin. In most cases its upper rim is separate from the adjacent whorl. The well-developed lamella superior ends as deep as, or deeper than, the outer end of the high lamella spiralis. The lamella inferior is well emerged, bending close to the superior. The end of the lamella subcolumellaris is usually visible at perpendicular view of the aperture. The long plica principalis reaches the swollen peristome margin. The long plica superior starts dorsally, then tends to bend downwards at its outer end. The plica basalis is diffuse, but well recognizable. In most cases one or two variably defined additional plicae are present between the superior and the basalis. The well developed inner and outer lobes of the clausilium enclose a sinus.

Shell height: 14.7 to 20.1 mm, shell width: 3.9 to 4.8 mm, aperture height: 3.8 to 4.8 mm, aperture width: 3.2 to 3.8 mm.

Etymology: The new subspecies is named after L. Németh for his valuable help in clarifying distribution data of several *Alopi*a forms.

Remarks: The new subspecies is the dextral equivalent of the sinistral nominate subspecies of *A. grossuana* Nordsieck, which inhabits the more southerly Sohodol Gorge in the same valley, 1 to 3 km N of Runcu (Nordsieck, H. 1977). Upstream of the gorge the valley widens, but at small isolated cliffs this *Alopi*a extends 1.5 km farther northward. Its northernmost known occurrence is separated from the type locality of *A. g. nemethi* subsp. nov. by a distance of 3.5 km, along which no limestone cliffs are exposed near the stream.

Based on the vicinity of the distribution ranges, recent systematic studies (Szekeres, M. 2007; Nordsieck, H. 2008) classified *A. grossuana* as a subspecies of *A. subcosticollis* (*A. Schmidt*, 1868). Analyses of the mitochondrial cytochrome oxidase (COI) gene sequences, however, revealed considerable phylogenetic distance between these two taxa, indicating that *A. grossuana* should be regarded as a distinct species (Z. Fehér, L. Németh, A. Nicoara & M. Szekeres, unpublished results).

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