

On *Granaria braunii marcusii* subspec. nov.

(Mollusca: Gastropoda Pulmonata: Chondrinidae)

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Granaria braunii marcusii subspec. nov. is described from E Spain. The distributional records of the two subspecies of *G. braunii* are summarized on a UTM distribution map.

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Introduction

The genus *Granaria* Held, 1837, is wide-spread, ranging from Spain in the west to Pakistan and Iran in the east (Gittenberger, 1973: 41). Up to now the generic range was known to be occupied by seven species that are largely allopatric. Recently, Mr H.B. Marcus (Moraira) discovered a hitherto unknown form of *Granaria* in eastern Spain and called our attention to it. It is most similar to its geographically closest relative, *G. braunii* (Rossmässler, 1842). The two taxa are considered subspecies of a single species. This will remain a matter of subjective judgment as long as a contact zone with either two separate forms, or intermediate interconnecting populations, remains unknown.

For collections the following abbreviations are used: Kui = J.G.J. Kuiper, Instituut voor Taxonomische Zoölogie, Amsterdam; Mar = H.B. Marcus, Moraira, Spain; MNHN = Muséum National d'Histoire Naturelle, Paris; MZB = Museo de Zoología, Barcelona; Nie = J.A.J.H. Nienhuis, Woltersum, The Netherlands; NMW = Naturhistorisches Museum, Wien; Rip = Th.E.J. Ripken, Delft, The Netherlands; RMNH = Nationaal Natuurhistorisch Museum, Leiden; SMF = Forschungs-Institut Senckenberg, Frankfurt am Main; Wit = W. F. de Wit, Amsterdam.

Systematic account

***Granaria braunii marcusii* subspec. nov.**

(figs. 1-3)

Material.— Spain. Holotype: Alicante, slope of a barranco E of urbanización Verde Pino, 2 km S of Benitachell (BC58), H.B. Marcus leg. (RMNH 56782). Paratypes. Alicante: Southwest-slope of Sierra de Montgó, 3 km SE of Denia, BC49 (Rip/2); slope at the east-side of La Garganta, 2 km SE of Gata de Gorgos, BC49 (Mar/105; RMNH 56783/2; Rip/4); type locality, BC58 (Mar/119; RMNH 56784/11, 56785/13, 56786/5, alc. 9355/10; Rip/2, 25); slope at the west-side of Barranco La Batalla, 3 km SE of Alcoy, 600 m alt. YH28 (Mar/14; Rip/3); limestone cliffs along the road from Alcalá to the main road Pego-Callosa, 2 km NE of Parcent, YH59 (Rip/3). Valencia: Sierra de la Murta, basin at the west-slope

of Pico del Caballo, 7 km E of Alcira, YJ23 (RMNH 56787/4; Rip/5); Sierra de la Murta, slope along road 2 km W of entrance "Las Fuentes", 8 km E of Alcira, YJ23 (Rip/3); slopes of small valley across road to quarry, 2 km SW of Jeresa, YJ42; isolated rock along road A7, 1 km SW of Jeresa, 50 m alt., YJ42 (Mar/5; Rip/3).

Most probably Gasull's (1975: 35) record of *G. braunii* from Valencia, Corbera d'Alcira, Les Fontanelles, 6 km NE of Alcira applies to the present subspecies.

Shell (fig. 1).— Shell with roughly a cylindrical lower half and a slender conical upper half, with 9-11½ convex whorls, separated by a deeply indented suture, and sculptured with prominent, rather widely spaced ribs (c. 10 ribs per mm above the aperture). Aperture with a reflected and moderately thickened, whitish lip. A series of elongated, accessory denticles, situated in line with the ribs, marks the parietal border; usually at least one of these denticles is more prominent than the other ones and continues inward as a (very) low angularis, running less than $\frac{1}{4}$ whorl deep inward, which is somewhat further than the front end of the parietalis. There may be additional prominent parietal denticles, viz. at the columellar side and between the angularis and the palatal side. In front view, the columellaris and the parietalis are about equally prominent, whereas the infracolumellaris is not or hardly discernible even in oblique view. Usually both the palatalis inferior and the palatalis superior reach the apertural lip, but the former lamella may become (totally) obsolete in front; in dorsal position, in contrast, the palatalis inferior is the most prominent lamella, whereas both folds are about equally high at the lamellae center, situated left lateral. In that region, three additional palatal lamellae are developed, viz., a short suturalis (the weakest lamella) and a suprapalatalis (about as high as the two main lamellae) above, and an infrapalatalis below. The palatal folds may continue as whitish lines from the lamellae center inward to the ventral side of the body whorl. At the lamellae center, at the parietal wall, the parietalis is the highest lamella and has an undulating margin; there is a short spiralis here, widely separated from the angularis. The shell basis is not clearly keeled; the umbilicus is narrow but clearly open. Behind the apertural lip

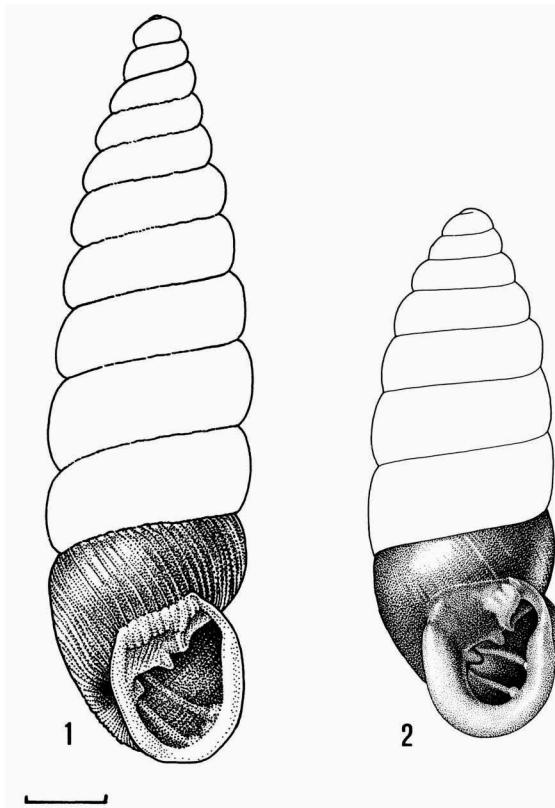


Fig. 1. *Granaria b. marcusii* subsp. nov., holotype. Spain, Alicante, slope of a barranco E of urbanización Verde Pino, 2 km S of Benitachell, BC58; H.B. Marcus leg. (RMNH 56782). E.J. Bosch del; fig. 2. *Granaria b. braunii* (Rossmässler); Spain, Lérida, between Coll de Nargó and Oliana (RMNH), actual height 6.7 mm; after Gittenberger, 1973: 54, fig. 17. W.C.G. Gertenhaar del.

and has an undulating margin; there is a short spiralis here, widely separated from the angularis. The shell basis is not clearly keeled; the umbilicus is narrow but clearly open. Behind the apertural lip

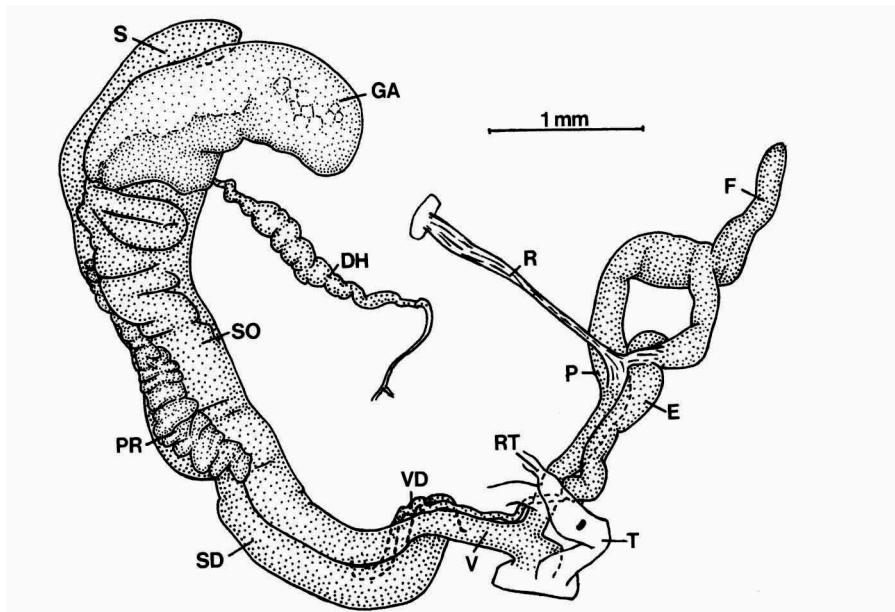


Fig. 3. *Granaria b. marcusii* subspec. nov., genitalia. Spain, Alicante, slope of a barranco E of urbanización Verde Pino, 2 km S of Benitachell, BC58; H.B. Marcus leg.

Abbreviations: DH = ductus hermaphroditicus; E = epiphallus; F = flagellum; GA = glandula albunifera; O = oviduct; P = penis; PR = prostata; R = penile retractor muscle; RT = retracting muscle of tentacle; S = spermatheca; SD = spermathecal duct; SO = spermoviduct; T = tentacle with eye-spot; V = vagina; VD = vas deferens.

there is no cervical swelling.

Height 6.8-9.8 mm, width 2.5-2.6 mm.

Genitalia.—The genitalia of a single dissected specimen (fig. 3) are not clearly different from those of *G. b. braunii* (see Gittenberger, 1973: 59, fig. 20). Much more material of both taxa should be studied to establish whether significant morphometric differences occur.

Differentiation.—*G. braunii marcusii* and *G. b. braunii* have about the same composition and distribution of apertural lamellae, with a characteristic, deeply-set lamellae center. The former subspecies can be distinguished from the latter one by (1) its more slender conical, elongated spire, (2) more convex whorls, (3) prominent, rather widely spaced ribs on the entire teleoconch, and (4) a less conspicuously thickened apertural lip. The differences in general shape are most obvious. The other diagnostic characters are not equally unequivocally clearly developed in all specimens. Shells of the nominate subspecies are sometimes more prominently sculptured than the extremely glossy specimen figured in the present paper (fig. 2) and the differences in prominence of the apertural lip are not always as convincing as shown in figs. 1 and 2. The other *Granaria* species known are very different from *G. b. marcusii* in apertural dentition, shape and dimensions, and sculpture.

Distribution.—The new subspecies is known from SE Valencia and NE Alicante, separated by a gap of over 150 km from the nearest localities at which the nominate subspecies has been recorded (fig. 4).

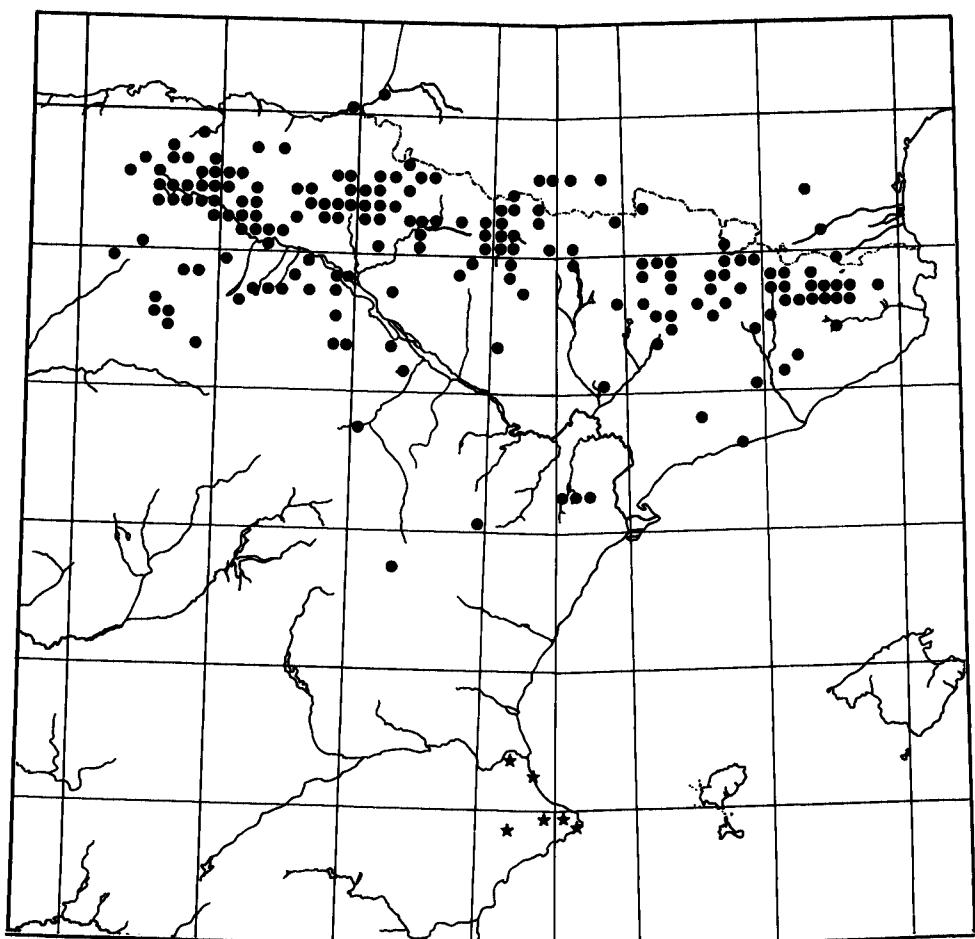


Fig. 4. UTM 10 km-grid distribution map of *G. b. braunii* (dots) and *G. b. marcusii* (stars); see the text.

Ecology.— Whereas *G. b. braunii* is found at a variety of relatively dry places, *G. b. marcusii* is restricted to shadowed slopes and limestone cliffs, occurring well hidden in crevices. The shells of live snails are covered with earth and, therefore, well camouflaged.

Notes.— Populations that are clearly intermediate between *G. b. braunii* and *G. b. marcusii* are not known. Nevertheless, the allopatric taxa are given subspecific status, because they are most certainly sister taxa, sharing various characters that are not found in the congeneric other species.

Records of *G. b. braunii*.— Because Gittenberger (1973) did not provide UTM 10 km-grid codes, the localities listed in that paper are repeated here, with UTM codes, and new data are added. The localities reported by Gomez & Rallo (1988: 107, map 15) are also used in the present distribution map of *G. braunii* (fig. 4). The records in the extreme SW of France are still based on old museum material only. The records concerning *G. b. braunii* in Algeria are neglected here (see Gittenberger, 1973: 62).

France. Aude: Défilé de Pierre-Lys, DH34 (Kui). Pyrénées-Atlantiques: Hendaye, WP90 (MNHN); Biarritz, XP11 (MNHN); N of the Col du Pourtalet, 1610 m alt., YN14 (Rip). Hautes-Pyrénées: Barèges, BH65 (MNHN); Cadéac - Gouaux, BH85 (Nie); Cauterets, YN35 (MNHN); Luz, YN45 (MNHN; SMF); St. Sauveur, YN45 (MNHN; SMF). Pyrénées-Orientales: La Preste, DG59 (MNHN); Villefranche-de-Conflent, DH41 (MNHN).

Andorra. Andorra la Vella - Sant Juliá de Lória, CH70 (RMNH).

Spain. Alava: 4.5 km N of Puerto de Orduña, VN95 (Rip). Barcelona: El Bruch, CG90 (SMF); Cardona, CG94 (MZB); Montserrat, DG00 (MZB; RMNH; Rip; SMF); Gironella, DG05 (SMF); Guardiola de Berga, DG07 (SMF); Greixa, DG08 (SMF); Mura, DG11 (MZB); Borredá, DG16 (RMNH); La Pobla de Lillet, DG17 (SMF); Castellar de Nuch, DG18 (SMF); Moyá, DG22 (MZB); Castelltersol, DG22 (SMF); Tona, DG33 (Kui); Montesquiu, DG36 (MZB). Burgos: Citorres del Páramo, VM29 (RMNH); Cuevas de San Clemente, VM56 (RMNH); Santo Domingo de Silos, VM64 (RMNH); 3 km NW of Santa Cruz del Valle Urbión, VM78 (RMNH); Santa Cruz del Valle Urbión, VM88 (RMNH); 3 km NW of Fresnedilla de la Sierra, VM88 (RMNH); Pradoluengo, VM88 (RMNH); Cueva, VN46 (RMNH); Puerto de Orduña, 900 m alt., VN95 (Rip; SMF). Gerona: Las Llosas, DG26 (Nie); 4 km NE of Ripoll, DG37 (Rip); Ripoll, DG37 (RMNH; Rip; SMF); Ribas de Freser, DG38 (RMNH; Rip); Vidrá, DG46 (RMNH); 5 km E of San Juan de las Abadesas, DG47 (Wit); S of Tavertet, DG54 (Rip); Puig Se-Calm, DG56 (MZB); Olot, DG57 (SMF); Sta. Maria, Sierra de Finestrals, DG66 (MZB); Montagut, DG67 (MZB); Lladó, DG87 (SMF). Guadalajara: Esplugares, WL50 (RMNH). Guipúzcoa: Vergara, WN47 (SMF). Huesca: Ainsa - Arro, BG69 (Wit); Castejón de Sos - Campo, BG80 (SMF); E of Benabarre, BG96 (RMNH); Boltaña - Ainsa, BH60 (RMNH); Benasque, BH92 (SMF); Escales de Sopeira, CG18 (SMF); Sipán, YM27 (RMNH); El Run, YN00 (SMF); N of Canfranc-Estación, YN03 (RMNH); Sabiñánigo, YN10 (Rip); Sallent de Gállego, YN13 (SMF); Broto, YN32 (RMNH); Torla, YN32 (RMNH); Bujaruelo -Puente de los Navarros, YN33 (RMNH); Fiscal- Boltaña, YN40 (RMNH). Lérida: Alsamora, CG16 (SMF); Sopeira, CG18 (RMNH); 5 km S of Pont de Suert, CG19 (Wit); Embalse de Camarasa, CG23 (RMNH); Sellés, CG25 (Kui); San Hoisme, CG25 (SMF); Portell dels Terradets, CG25 (SMF); Portell del Montsech, CG25 (SMF); Pont de Suert - Senterada, CG29 (RMNH); Sarroca de Bellera, CG29 (RMNH); Artesa de Segre - Salgá, CG34 (MZB); Vilanova de Meya, CG35 (SMF); Pobla de Segur, CG37 (SMF); Erinyá, CG38 (SMF); Montcortés, CG38 (SMF); Desfiladero de Collegats, CG38 (SMF); 5 km S of Senterada, CG38 (RMNH); Pobleta de Bellvehi, CG39 (SMF); Coll de Nargó - Valldarques, CG56 (RMNH); Coll de Nargó - Oliana, CG56 (RMNH; SMF); Oliana, CG65 (RMNH); Garganta de Orgaña, CG67 (RMNH; Rip); Pla de Sant Tirs - Novés, CG68 (Wit); Odén, CG76 (RMNH); Ges, CG78 (RMNH); Ortedó - Alás, CG78 (RMNH); Estimarriu - Arseguell, CG79 (Rip); Torres - Seo de Urgel, CG79 (RMNH); Fornols, CG87 (RMNH); Tuxent, CG87 (RMNH); Josa del Cadí, CG87 (RMNH); Barrio de San Vicente, CG89 (Rip); Arseguell - Torres, CG89 (Wit); Pont de Bar - Torres, CG89 (RMNH); Martinet, CG99 (RMNH); Prulláns - Martinet, CG99 (Wit); Artigua de Lint, Valle de Arán, CH13 (RMNH). Logroño: Autol, WM87 (SMF). Navarra: Alsásua, WN64 (RMNH); Estella, WN72 (RMNH); W of Iragui, XN15 (Wit); Yesa - Javier, XN52 (RMNH). Tarragona: Mt. Caro W of Tortosa, BF72 (RMNH; SMF); Figueral, CF58 (RMNH); Calafell, CF86 (MZB). Teruel: Fuentespaldá, BF52 (MZB); Beceite, BF62 (RMNH); Albarracín, XK37 (RMNH); Aliaga, XL90 (RMNH). Vizcaya: Traslaviña, VN88 (Rip). Zaragoza: Ateca, XL07 (SMF); Borja - Épila, XM31 (SMF).

References

- Gasull,L., 1975. Fauna malacológica terrestre del sudeste Ibérico.— Boletin Soc. Hist. Nat. Baleares 20: 5-155.
 Gittenberger, E., 1973. Beiträge zur Kenntnis der Pupillacea III. Chondrininae.— Zool. Verh. Leiden 127: 1-267.
 Gomez, B.J. & A.M. Rallo, 1988. Consideraciones biogeográficas de la subfamilia Chondrininae en las regiones de Pirineos-occidentales, Cantábrico-oriental, valles alto y medio del Ebro y N del sistema Iberico.— Iberus 8 (2): 103-109.

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