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Jeanclaudella, a replacement name for the Jurassic gastropod genus *Aaleniella* Conti & Fischer, 1981 and a review of its type material

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Abstract

The name *Aaleniella* was proposed by Conti & Fischer (1981) for a fossil vetigastropod genus coming from Middle Jurassic deposits of Umbria (central Apennine, Italy). However, this name is junior homonym of an Upper Aalenian eucytherid ostracod genus instituted by Plumhoff (1963). *Jeanclaudella* nom. nov. is here proposed as replacement name for the gastropod genus. The restudy of the original material facilitated a revision of the suprageneric position of *Jeanclaudella* and an emendation of its diagnosis. The names of the three species originally included are recombined as *Jeanclaudella umbriensis* (Conti & Fischer, 1981) new comb., *Jeanclaudella variata* (Conti & Fischer, 1981) new comb. and *Jeanclaudella zigrinata* (Conti & Fischer, 1984) new comb. and their distinctive characters are here better defined.

Key words: Eucycloidea, nomenclature, systematics, Central Apennine, Middle Jurassic

Introduction

The fossil gastropod genus *Aaleniella* Conti & Fischer, 1981 is one of the numerous taxa composing a rich Middle Jurassic gastropod fauna studied by Conti & Fischer (1981, 1984) coming from an outcrop near Case Canepine, a small village in the Martani Mountains (Umbria, central Italy). Its name refers to the age of the gastropod-bearing bed which was initially recognized as Aalenian (Conti & Fischer 1981). However, subsequent detailed stratigraphical and sedimentological investigations (Conti & Fischer 1984) ascertained that this bed is a polyphase neptunian sill within the Toarcian portion of the succession, where distinct Aalenian and Bajocian filling phases are present. The discovery of ammonites indicating the *Stephanoceras humpriesianum* Zone (Pallini 1982) allowed to assign the gastropod-bearing filling to the lower Bajocian. Conti & Fischer (1981, 1984) erected the following species of *Aaleniella*: *Aaleniella umbriensis* Conti & Fischer, 1981, *Aaleniella zigrinata* Conti & Fischer, 1981, and *Aaleniella variata* Conti & Fischer, 1984.

In the last years, the availability of online databases of zoological names and nomenclatural acts made it easier to discover cases of homonymy. A search for the name *Aaleniella* in online resources, such as the Interim Register of Marine and Nonmarine Genera, (https://www.irmng.org, accessed May 2025), the MolluscaBase (https://www.molluscabase.org, accessed May 2025) and Wikispecies (https://species.wikimedia.org/wiki/Main_Page, accessed May 2025), retrieved a previous use of this name. Plumhoff (1963, p. 37) proposed *Aaleniella* for an Upper Aalenian ostracod genus (Eucytheridae, Arthropoda), the type species being *Aaleniella compressa* Plumhoff, 1963 (p. 38, pl. 7, figs 107–114) (see also Tesakova 2022). Therefore, *Aaleniella* Conti & Fischer, 1981 is a junior homonym (ICZN 1999, art. 52). At the time, Conti & Fischer (1981) did not recognize that the name was already in use since in the Nomenclator Zoologicus (Edwards & Vevers 1975, p. 1) Plumhoff's genus was misspelled as *Aalenilla* Phemhoff. In order to remove this homonymy, the name of the gastropod genus is replaced here with *Jeanclaudella* nom. nov. The proposal of this change has been taken as an opportunity to restudy the original material in order to amend the genus, to review its suprageneric position and to define better the diagnostic characters of the species included.

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Material and methods

The original material of *A. umbriensis, A. variata* and *A. zigrinata* is represented by nine specimens stored at the Museum of Palaeontology of the Department of Earth Sciences, University 'La Sapienza', Rome (Italy) (MPUR), collection MAC. The systematic arrangement at the highest taxonomic ranks follows Bouchet *et al*. (2017) integrated with the information reported in MolluscaBase (2025). The family attribution follows also the indications in Gründel (2007), Bandel (2010) and Szabó *et al*. (2019). The photographs were made with the focus stacking method on specimens coated with ammonium chloride and elaborated with Helicon Focus Pro 8.3.3 software. The symbols used in the chresonymy lists are those defined by Matthews (1973). Most of the morphological terms applied in the systematic descriptions follow the terminology summarized by Cox (1960).

Systematic Palaeontology

Subclass Vetigastropoda Salvini-Plawen, 1980

Order Seguenziida Haszprunar, 1986

Superfamily Eucycloidea Koken, 1896

Family Eucyclidae Koken, 1896

Genus *Jeanclaudella* nom. nov.
Zoobank LSID: urn:lsid:zoobank.org:act:5E62CA2E-08CF-4DFA-8C16-906FD4EC6529

pro *Aaleniella* Conti & Fischer, 1981 non Plumhoff, 1963

Type species. *Aaleniella umbriensis* Conti & Fischer, 1981. Umbria (Central Apennine, Italy), lower Bajocian, *Stephanoceras humpriesianum* Zone.

Derivation of name. Dedicated to Jean-Claude Fischer (1930–2009), late palaeontologist of the Muséum National d'Histoire Naturelle (Paris, France) who greatly contributed to the knowledge of the Jurassic palaeontology, early tutor of one of the present authors (MAC) and co-author of the genus *Aaleniella*.

Original diagnosis (Conti & Fischer 1981, p. 141). Shell trochiform. Spire elevated. Whorls flat or slightly concave. Last whorl occupying 2/3 of the total height, subcarinated at the periphery. Ornament of collabral costellae, possibly increased by spiral arrangements. Aperture suborbicular, holostomatous; outer lip moderately prosocline; columellar lip unthickened, scarcely curved. Umbilicus very narrow, without margin.

Emended diagnosis. Shell trochiform, few millimetres high, with conoidal to distinctly cyrtoconoidal outline. Early whorls well-rounded. Surface of adult whorls concave. Last whorl representing about 70% of shell height. Periphery angulated and carinate, placed just above suture. Base slightly convex, to moderately inflated and with narrow umbilicus. Aperture rounded-quadrangular. Peristome with thin parietal inductura. Columellar lip slightly arched and simple. Early whorls bearing evenly distributed, prosocline and opisthocyrt collabral riblets. Adult whorls ornamented by prosocline ribs/riblets forming nodes along subsutural band and on peripheral keel. Collabral ornament attenuating or vanishing on median part of whorl surface during growth. Base with spiral threads/cords.

Remarks. The genus was assigned to the subfamily Margaritinae Thiele, 1924 by Conti & Fischer (1984), a taxon currently considered of family rank within the superfamily Trochoidea Rafinesque, 1815 (Bouchet *et al*. 2017). However, the rounded earliest teleoconch whorls sculptured by a regular pattern of collabral ribs indicate that *Jeanclaudella* nom. nov. belongs to the superfamily Eucycloidea Koken, 1896. Members of the family Eucyclidae Koken, 1896 are charaterized by the appearance of a single spiral keel on the abapical part of the whorls on the earliest teleoconch whorls (in addition to axial ribs), which commonly changes into an angulate and carinate periphery on the subsequent whorls (Gründel 2007; Szabó *et al*. 2019). Another spiral element, less prominent than the peripheral keel, can appear near the adapical suture. The appearance of this spiral ornament in *Jeanclaudella*, though late during the early ontogeny, suggests that this genus belongs to Eucyclidae. Moreover, in *Jeanclaudella*

the peristome is discontinuous and provided only with a thin inductura on the parietal lip. According to Bandel (2010), the discontinuity of the peristome is another distinctive aspect of this family.

Within the Eucyclidae, *Jeanclaudella* shows the closest similarity to *Mistelgauia* Schulbert & Nützel, 2013, especially in the pattern and ontogeny of the main elements of the ornament. A small umbilicus is also present in those species previously ascribed to *Tylotrochus* Koken, 1896 by Gründel (1999) and Gründel *et al*. (2011) and subsequently moved to *Mistelgauia* by Schulbert & Nützel (2013). *Jeanclaudella* differs from *Mistelgauia* in having a trochiform shell. The shell of *Mistelgauia* is more globose, with a much higher and distinctly inflated base. Moreover, the base has a reticulate ornament of spiral cords and regularly spaced collabral threads. This ornament pattern is quite frequent in the eucycloideans and is considered as a diagnostic character of *Mistelgauia* by Schulbert & Nützel (2013), but it is absent in *Jeanclaudella*.

The protoconch of *Jeanclaudella*, is preserved only in *Jeanclaudella variata* (Conti & Fischer, 1981) (see below), which is not the type species. In *J. variata*, the protoconch is much more prominent than in *Mistelgauia* and makes the apex submamillate. The characters of the peristome of the type species of *Mistelgauia* are unknown, but *M. raresculptata* shows an aperture which is much wider and rounded than in *Jeanclaudella*. Based on the outline of the last whorl and the inflated base, a similar shape of the aperture is most probably shared also by the type species. Furthermore, in *M. raresculptata* the inner lip is thickened and bears a narrow crescent-shaped furrow, whereas in *Jeanclaudella* it is thin and simple.

All the three species of *Jeanclaudella* show concave adult whorls. In the type species of *Mistelgauia*, *Mistelgauia monarii* Schulbert & Nützel, 2013 (p. 734, figs 9A–I *cum syn*.), and in the other species assigned to this genus by Schulbert & Nützel (2013), namely *Mistelgauia raresculptata* (Gründel, 1999) (p. 632, pl. 2, figs 2–7), the surface of the adult whorls is flat to slightly convex. However, in *Calliotropis* (*Riselloidea*) *faustiankensis* Ferrari & Kaim, 2018 (p. 7, figs 3K–N, 5A–L), a species clearly belonging to *Mistelgauia,* the adult whorls are concave.

The close similarity between *Mistelgauia* and *Jeanclaudella* could also suggest subgeneric relationships. In this case, the differences could reflect the different stratigraphical distribution and the paleobiogeographical disjunction of these taxa. Indeed, the species of *Mistelgauia* come from deposits of the European epicontinental shelf: the type species from the Toarcian/Aalenian transition of Franconia (southern Germany), *M. rarescuptata* from the upper Pliensbachian of Grimmen (northern Germany) and *M. faustiankensis* from the middle Bathonian of Poland. In contrast, the species of *Jeanclaudella* are known until now only from the Bajocian pelagic sediments of the central part of western Tethys.

Jeanclaudella shares with *Riselloidea* Cossmann, 1909, *Biarmatoidella* Gründel, 2003 and *Paleunema* Kittl, 1891 the trochiform shape of the shell, the concave adult whorls, the presence of a peripheral angulation running just above the suture, and the adult ornament pattern of collabral ribs forming a row of nodes or granulations just below the suture and at the intersection with the peripheral carina.

Kaim (2004) considered *Riselloidea* as junior synonym of *Calliotropis* Seguenza, 1902. Ferrari *et al*. (2014) and Ferrari & Kaim (2018) argued that there are no compelling reasons to keep them separate as well. However, they preferred to treat *Riselloidea* as an arbitrary temporal subgenus of *Calliotropis* due to its markedly different stratigraphic distribution. These authors interpreted *Calliotropis* in a very extensive way and assigned numerous Jurassic and Cretaceous species to *Calliotropis* (*Riselloidea*), including those previously ascribed to *Biarmatoidella* and, possibly, to the Late Triassic genus *Trochonodus* Nützel *et al*., 2003. In contrast, the cladistic analysis performed by Pérez *et al.* (2022) demonstrates that both *Riselloidea* and *Trochonodus* represent clades distinct from *Calliotropis*. Based on the type species of *Riselloidea*, namely *Risellopsis subdisjuncta* Cossmann, 1907 (p.59, pl. 2, figs 10–12; Cossmann 1916, p. 127, pl. 4, 14–15; see also the online catalogue of the Muséum National d'Histoire Naturelle, Paris, France, https://science.mnhn.fr, accessed May, 2025), *Riselloidea* differs from *Jeanclaudella* in the anomphalous and flat base and in the presence of a smooth callus which strengthens the columellar lip and extends towards the axial region of the base (Cossmann 1907, 1916).

As far as *Biarmatoidella* is concerned, the results of the cladistic analysis by Pérez *et al.* (2022) are ambiguous. They show that the type species, *Biarmatoidella biarmata* (Münster in Goldfuss, 1844) (p. 55, pl. 180, fig. 2; Ferrari & Kaim 2018, p. 5, figs 3A–J *cum syn*.) and *Riselloidea vierowiensis* Gründel, 2000 (p. 230, pl. 6 figs 16–17; Gründel 2003b, p. 153, pl. 5, figs 6–7) form the sister-group of *R. subdisjuncta*. According to these authors, this indicates that *Biarmatoidella* belongs to the *Riselloidea* clade and is a junior synonym of *Riselloidea*, as was also suggested by Kaim (2004), Bandel (2010), Ferrari *et al*. (2014), and Ferrari & Kaim (2018). However, as remarked also by Pérez *et al*. (2022), *R. vierowiensis* could be alternatively considered a species of *Biarmatoidella* and the

possible inclusion into the analysis of other species, such as *Biarmatoidella lorioli* (Greppin, 1898) (p. 48, pl. 5, figs 5–7; Gründel 2003a, p. 65, pl. 6, figs 9, 10) could reveal that this genus is monophyletic and sister-group of *Riselloidea*. Whatever the taxonomic status of *Biarmatoidella* is, its type species is not congeneric with the species of *Jeanclaudella*. It differs in the absence of an umbilicus and in the stout columellar lip provided with a wide and excavated crescent-shaped callus.

Paleunema, a genus recently revised by Karapunar & Nützel (2021, p. 123, fig. 77), is anomphalous and ornamented by distinctly sinuous collabral ribs which form prominent, scaly and hollow nodes on the peripheral keel. Furthermore, a weak spiral cord runs in the upper half of the whorl surface. The collabral ribs make nodes at intersection with this cord where they become bifurcated. The same characters making *Jeanclaudella* similar to the genera mentioned above are present also in *Eunemopsis* Kittl, 1891, type genus of the eucycloidean family Eunemopsidae Bandel, 2010. However, the lamellar spiral ridge on the columellar lip which characterizes the members of this family (Bandel 2010) is absent in *Jeanclaudella*.

Jeanclaudella umbriensis (Conti & Fischer, 1981) new comb.

Fig. 1A–J

v* 1981 *Aaleniella umbriensis* Conti & Fischer, p. 141, figs 7–10.
v 1984 *Aaleniella umbriensis* Conti & Fischer, p. 138, pl. 2, figs 11a–c, 12.

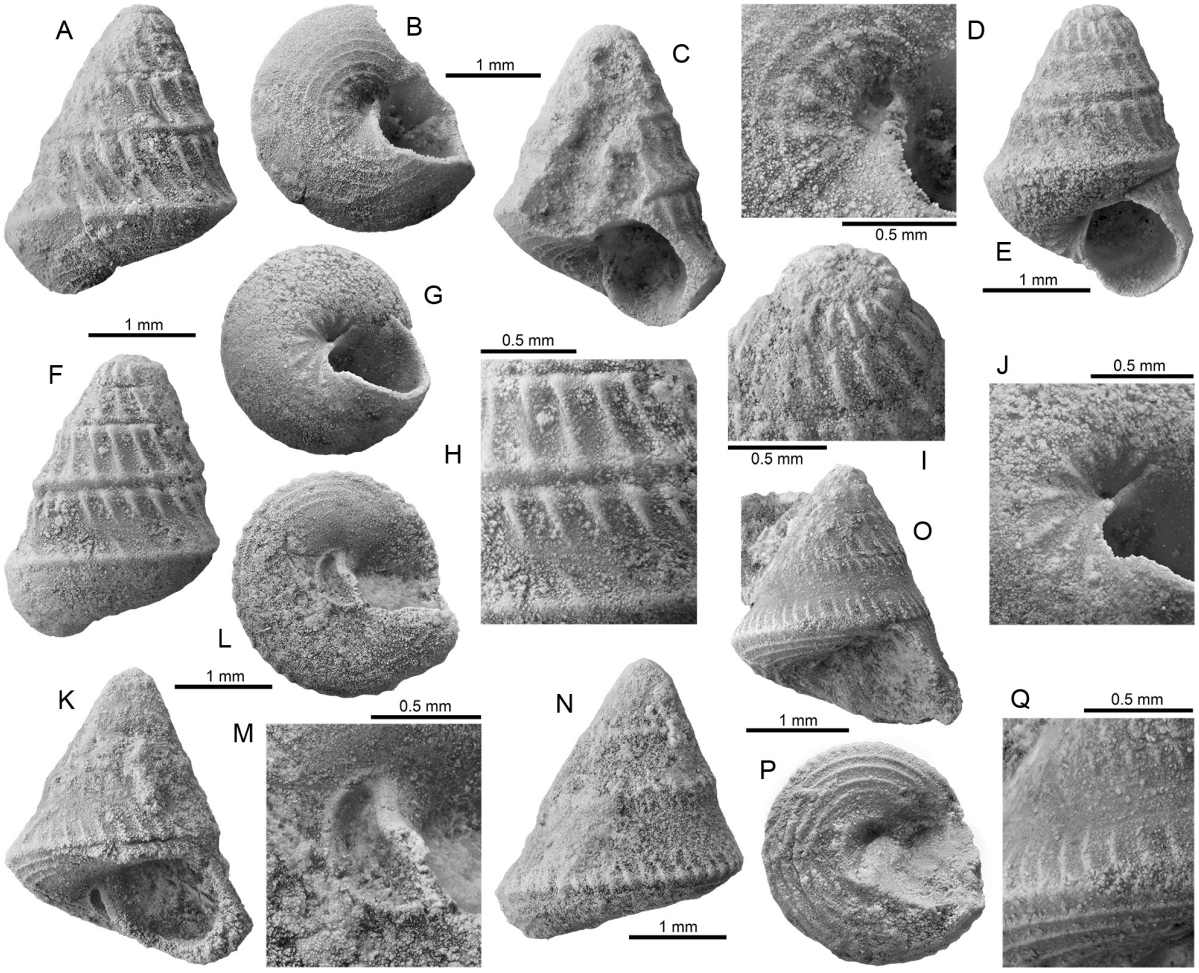

FIGURE 1. *Jeanclaudella* nom. nov., Case Canepine (Umbria, central Apennine, Italy), lower Bajocian, *Stephanoceras humphriesianum* Zone. A–J, *Jeanclaudella umbriensis* (Conti & Fischer, 1981). A–D, Holotype MAC5A, dorsal, basal and apertural views, and detail of the umbilical region. E–J, paratype MAC5B, apertural, dorsal and basal views, detail of the last two whorls, detail of the early spire and detail of the umbilical region. K–Q, *Jeanclaudella zigrinata* (Conti & Fischer, 1984). K–N, holotype MAC33A, apertural and basal views, detail of the umbilical region and dorsal view. O–Q, paratype MAC33B, apertural and basal views, and detail of the last whorl.

Material. Holotype MPUR MAC5A, Paratype MPUR MAC5B. Case Canepine (Martani Mountains, Umbria, central Italy), lower Bajocian, *Stephanoceras humphriesianum* Zone.

Description. The shell is small (max height 3.2 mm; width 2.5 mm), with trochiform, slightly cyrtoconoidal shape and composed of five whorls. The protoconch is poorly preserved and probably slightly wider than 0.2 mm. The first two teleoconch whorls are distinctly and evenly convex. Subsequently the whorl surface becomes rapidly concave while the periphery becomes sharply carinate, and another, less marked spiral keel appears in subsutural position. The suture runs in a groove edged adapically by the peripheral keel and abapically by the subsutural keel. The last whorl is about 0.70 of the height of the shell. The base is convex and somewhat inflated, with a small umbilicus. The aperture is rounded-quadrangular. The peristome is provided with a thin parietal inductura. The columellar lip is simple and weakly arched. The outer lip is thin and slightly angulated at the end on the peristome of the peripheral carina. The ornament of the early shell consists of marked, rather prosocline and slightly prosocyrt collabral ribs which are separated by wider interspaces. On the last whorls, the collabral ribs can become less prosocyrt and less sharp on the median part of the whorl surface. They form nodes at the intersection with the peripheral and subsutural keels. The nodes become less prominent to almost obscure on the peripheral keel of the last whorl. The base is ornamented with about ten, sharp, thin, widely and subequally distributed spiral threads. The periaxial part of the base and the umbilical region lack of spiral threads and bear barely distinct collabral riblets. These riblets end at the most adaxial spiral thread where they form small nodes. The growth lines are prosocline and prosocyrt on the surface of the whorls and widely opisthocyrt on the base.

Remarks. The holotype shows the apical region smoothened by erosion and the peristome strongly fragmentary. In the paratype the peristome is more complete. The shape of the protoconch is not clearly recognizable due to poor preservation. However, what can be seen in the apical region of the holotype indicates that the protoconch was probably only slightly wider than 0.2 mm (Fig. 1I). Comparisons with the other congeneric species are discussed below.

Jeanclaudella zigrinata (Conti & Fischer, 1984) new comb.

Fig. K–Q

v* 1984 *Aaleniella zigrinata* Conti & Fischer, p. 138, pl. 2, figs 15a–c.

Material. Holotype MPUR MAC33A, Paratype MPUR MAC33B. Case Canepine (Martani Mountains, Umbria, central Italy), lower Bajocian, *Stephanoceras humphriesianum* Zone.

Description. The shell is small (max height 2.9 mm; width 2.6 mm) trochiform, almost conoidal in outline and composed of at least four whorls. The protoconch is not preserved. The last whorl is 0.72 of the height of the shell. The early preserved whorl is well rounded. The surface of the subsequent whorls is flat and becomes slightly concave on the last whorl. The suture is almost flush on the adult part of the shell. The periphery is sharply angulated and marked by a thin spiral keel. The base is convex, moderately inflated and narrowly phaneromphalous. The aperture is seemingly rounded-quadrangular. The peristome is discontinuous and with a thin parietal inductura. The outer lip is thin and angulated at the periphery. The columellar lip is seemingly slightly arched. The ornament of the earliest preserved whorls consists of collabral riblets. The adult whorls bear somewhat thin, almost straight and prosocline collabral riblets separated by wider interspaces. During the growth, the number of the collabral riblets per whorl increases from about 20 to about 40. The collabral ribs form small nodes on the peripheral keel and vanish on the median part of the whorl surface. The base is ornamented by five, sharp, widely and regularly spaced spiral threads. The more adaxial spiral thread is stronger than the others and encircles the umbilical region. The growth lines are not visible.

Remarks. Although the apical part of the holotype is slightly smoothened by erosion, the evenly convex shape and the collabral ornament of the earliest whorls are still partly recognizable. In the paratype the apical shell is broken. In both specimens the peristome is incomplete. *Jeanclaudella zigrinata* (Conti & Fischer, 1984) differs from *Jeanclaudella umbriensis* (Conti & Fischer, 1981), in having an evenly conoidal outline of the shell with less inflated base, and in the much thinner and more numerous collabral riblets. In addition, the umbilical cavity is encircled by a spiral keel whereas in *J. umbriensis* it bears granulate collabral elements.

***Jeanclaudella variata* (Conti & Fischer, 1981) new comb.**
Fig. 2

v* 1981 *Aaleniella variata* Conti & Fischer, p. 141, figs 4–6.
v 1984 *Aaleniella variata* Conti & Fischer, p. 138, pl. 2, figs 13a–c, 14.
v 1994 *Aaleniella variata* Conti & Monari, p. 199, fig. 1c.

Material. Holotype MPUR MAC19A, four Paratypes, MPUR MAC19B-MAC19E. Case Canepine (Martani Mountains, Umbria, central Italy), lower Bajocian, *Stephanoceras humphriesianum* Zone.

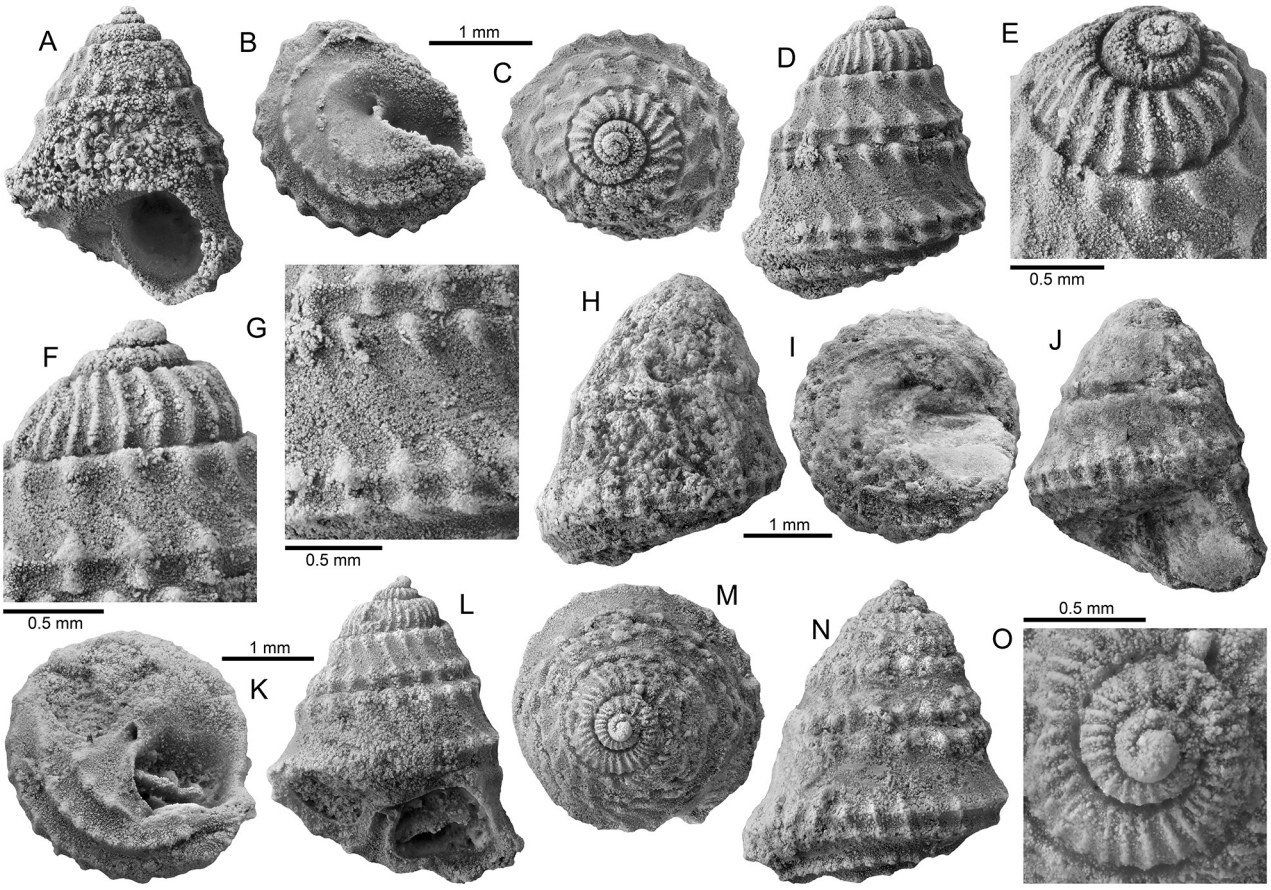

FIGURE 2. *Jeanclaudella variata* (Conti & Fischer, 1981), Case Canepine (Umbria, central Apennine, Italy), lower Bajocian, *Stephanoceras humphriesianum* Zone. A–G, holotype MAC19A, apertural, basal, apical and dorsal views, details of the early spire in oblique and axial views and detail of the ornament of the last whorl. H–J, paratype MAC19B, dorsal, basal and apertural views. K–O, paratype MAC19C, basal, apertural, apical and dorsal views, and detail of the early spire.

Description. The shell is small-sized (max height 3.4 mm; width 2.9 mm) and composed of five whorls. Its shape is rather cyrctoconoidal. The protoconch is prominent and seemingly consists of less than one volution. Its width is about 0.25 mm. The coiling axis of the protoconch is slightly deviated from that of the subsequent whorls and this makes the apex prominent and submamillate. The first three whorls are strongly and evenly convex with the suture well-impressed and incised. They increase rapidly in height after the first teoleoconch whorl. During the growth of the third whorl, the surface of the whorl becomes rapidly concave. It is edged adaxially by a subsutural spiral keel and abaxially by a stronger peripheral keel. These two keels border a groove where the suture runs. The last whorl is 0.69–0.74 of the height of the shell. The base is convex, moderately inflated and narrowly umbilicated. The aperture is rounded-quadrangular. The peristome is discontinuous and provided with a thin parietal inductura. The early teleoconch whorls are ornamented with 20–30 strong and opisthocyrt collabral ribs. The adult part of the shell bears more widely spaced and distinctly prosocline collabral ribs which form roundly pointed nodes on the spiral keels. The collabral ribs become thinner or disappear on the median band of the whorl surface. The base is

sculptured by three strong, widely spaced spiral keels separated by concave interspaces. The most abaxial spiral keel is coupled by the peripheral keel and is just covered by the suture. The three spiral keels of the base bear nodes at intersection with low collabral ribs which tend to vanishing in adaxial direction within the interspaces. The growth lines are strongly prosocline and slightly sinuous on the spire, and widely opisthocyrt on the base.

Remarks. The prominent and slightly deviated protoconch, which gives to the apex a submamillated shape, is a notable feature of *Jeanclaudella variata* (Conti & Fischer, 1981). Its size is well-comparable with that of other Mesozoic eucycloideans (e. g., Bandel 2010).

The other species of *Jeanclaudella* differ from *J. variata* in the conoidal or less cyrtoconoidal outline of the shell, in the early teleoconch whorls increasing more slowly and more regularly in height during the growth and in the coarser ornament. In *J. variata*, the collabral ribs of the adult part of the shell are stronger and make more prominent, subpointed nodes both on the subsutural and peripheral keel. Moreover, the base is ornamented only with three, nodose and much stronger spiral keels of which the outermost runs alongside the peripheral keel.

Mistelgauia faustiankensis (Ferrari & Kaim, 2018) differs from *J. variata* in characters here considered of genus level i. e., the more globose shape of the shell with inflated base and the ornament of the base. Other differences from *J. variata* are the conoidal outline of the shell, the blunt apex and the regular increment of the height of the whorls during the growth.

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