



HAL
open science

Aristocystitidae (Echinodermata, Blastozoa): Systematic and taxonomic review

Yamouna Makhoulf, Bertrand Lefebvre, Elise Nardin, Christopher R. C. Paul

► **To cite this version:**

Yamouna Makhoulf, Bertrand Lefebvre, Elise Nardin, Christopher R. C. Paul. Aristocystitidae (Echinodermata, Blastozoa): Systematic and taxonomic review. 11th European Conference on Echinoderms, Bertrand Lefebvre; Thomas Saucède, Oct 2023, Villeurbanne, France. hal-04271138

HAL Id: hal-04271138

<https://hal.science/hal-04271138v1>

Submitted on 5 Nov 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



ECE 11

Lyon, France

ABSTRACT BOOK

11th European Conference on Echinoderms (ECE11)

October 16–20, 2023

Lyon, France

Aristocystitidae (Echinodermata, Blastozoa): Systematic and taxonomic review

Yamouna MAKHLOUF¹, Bertrand LEFEBVRE^{2,3}, Elise NARDIN³
& Christopher R.C. PAUL⁴

¹ Université Frères Mentouri Constantine 1, Constantine, Algérie. Yamouna.makhlouf@umc.edu.dz

² UMR CNRS 5276 LGLTPE, Université Lyon 1, Villeurbanne, France. bertrand.lefebvre@univ-lyon1.fr

³ UMR CNRS 5563 GET, Université de Toulouse 3, Toulouse, France. Elise.nardin@get.omp.eu

⁴ The Beeches, Rhode Lane, Uplyme, Lyme Regis, Dorset, DT7 3TU, UK. glrcp@bristol.ac.uk

The Early Palaeozoic represents a critical time interval of life's history, during which echinoderms, as most other metazoans, underwent a major radiation. In this context, the subphylum Blastozoa Sprinkle, 1973 is of particular interest, as its morphological diversity was significantly concentrated early in its history (Foote, 1992). Aristocystitid specimens are generally poorly preserved (incomplete theca) and, very frequently, they do not show the oral surface, which is of prime taxonomic importance. Frequently, the taxonomic identification of many aristocystitid taxa simply relies on fragmentary portions of theca, mostly aboral regions, and is based on characters such as the shape and size of the theca; the shape, size and arrangement of thecal plates; the structure and arrangement of respiratory pores; and the occurrence of anatomical elements added as tubercles (Escribano Ródenas *et al.*, 1999; Gutiérrez-Marco & Aceñolaza, 1999; Gil Cid & García Rincón, 2012). In addition, aristocystitids are one of the blastozoan clades displaying the widest morphological diversity, which makes precise definition and taxonomy very difficult (Kesling, 1968; Paul & Kesling, 1968).

Since the last works of Chauvel (1980) and Chauvel & Meléndez (1986), systematic revisions were carried out on several aristocystitid taxa: *Aristocystites* (Parsley, 1990; Paul & Parsley, 2019), *Enodicalix* (Gutiérrez-Marco & Aceñolaza, 1999; Paul & Gutiérrez-Marco, 2020), *Binocalix* (McDermott & Paul, 2019), *Lepidocalix* (Makhlouf *et al.*, 2017), *Oretanocalix* (Gutiérrez-Marco, 2000; Paul & Gutiérrez-Marco, 2022), and *Prokopius* (Paul, 2018). However, the identification of the Ordovician aristocystitid *Calix* remains problematic, and will require to review the morphology of all taxa assigned to it, to critically reevaluate their assignment to that genus, and ultimately, to identify key characters for the diagnosis of *Calix* (Makhlouf *et al.*, in progress). However, although the characters of the type species of *Calix* are well established, all other species currently assigned to *Calix* require thorough morphological review, to reevaluate their assignment to that genus (Makhlouf *et al.*, in progress). The same work has to be done for all other problematic aristocystitid genera, such as *Glaphocystis*, *Phlyctocystis*, and *Maghrebozystis*. The systematics of the family Aristocystitidae remain unclear, and would benefit from a thorough revision, including a phylogenetic analysis and the systematic review of several taxa (Makhlouf *et al.*, in progress).

References

- Chauvel, J. 1980. Données nouvelles sur quelques Cystoïdes Diploporites (Echinodermes) du Paléozoïque armoricain. *Bulletin de la Société géologique et minéralogique de Bretagne C*, **12**, 1–28.
- Chauvel, J. & Meléndez, B. 1986. Note complémentaire sur les échinodermes ordoviciens de Sierra Morena. *Estudios Geológico*, **42**, 451–459.
- Foote, M., 1992, Paleozoic record of morphological diversity in blastozoan echinoderms (evolutionary radiation / macroevolution / clade shape). *Proceedings of the National Academy of Sciences of the United States of America*, **89**, 7325–7329.

- Gil Cid, M.D. & García Rincón, J.M. 2012. Thecal (oral zone) elements in cystoids from Spain. *Neues Jahrbuch für Geologie und Paläontologie, Abhandlungen*, **264**, 181–190.
- Gutiérrez-Marco, J.C. 2000. Revisión taxonómica de “Echinosphærites” murchisoni Verneuil y Barrande, 1855 (Echinodermata, Diploporita) del Ordovícico Medio centroibérico (España). *Geogaceta*, **27**, 83–86.
- Gutiérrez-Marco, J.C. & Aceñolaza, G.F. 1999. *Calix inornatus* (Meléndez, 1958) (Echinodermata, Diploporita): morfología de la región oral de la teca y revision bioestratigráfica. *Temas Geológico-Mineros ITGE*, **26**, 557–565. Madrid.
- Kesling, R.V. 1968. Cystoids, in: Moore, R.C. (ed.), *Treatise on Invertebrate Paleontology. Part S. Echinodermata*. Geological Society of America, New York, 86–267.
- Makhlouf, Y., Lefebvre, B., Nardin, E., Nedjari, A. & Paul, C.R.C. 2017. The diploporite blastozoan *Lepidocalix pulcher* from the Middle Ordovician of northern Algeria: taxonomic revision and palaeoecological implications. *Acta Palaeontologica Polonica*, **62**(2), 299–310.
- McDermott, P.D. & Paul, C.R.C. 2019. A new Upper Ordovician aristocystitid diploporite genus (Echinodermata) from the Llanddowror district, South Wales. *Geological Journal*, **54**(1), 529–536.
- Parsley, R.L. 1990. *Aristocystites*, a recumbent diploporid (Echinodermata) from the Middle and Late Ordovician of Bohemia, ČSSR. *Journal of Paleontology*, **64**, 278–293.
- Paul, C.R.C., 2018, *Prokopius*, a new name for “*Hippocystis sculptus*” Prokop, 1965, and the status of the genus *Hippocystis* Bather, 1919 (Echinodermata; Diploporita). *Bulletin of Geosciences*, **93**(3), 337–346.
- Paul, C.R.C. & Gutiérrez-Marco, J.C. 2020. *Enodicalix* (Diploporita, Aristocystitidae): A new echinoderm genus from the Middle Ordovician of Spain. *Geologica Acta*, **18**(3), 1–8.
- Paul, C.R.C. & Kesling, R.V. 1968. Review of J. Chauvel, "Echinodermes de l'Ordovicien du Maroc". *Journal of Paleontology*, **42**, 245–247.
- Paul, C.R.C. & Parsley, R.L. 2019. ‘*Aristocystites? subcylindricus* var. *de bohemicus* Barrande, 1887’ is a valid species of *Aristocystites* (Echinodermata, Diploporita): description and taxonomic consequences. *Journal of Paleontology*, **93**(4), 822–826.
- Sprinkle, J. 1973. *Blastozoan echinoderms*. Cambridge, Harvard University Museum of Comparative Zoology Special Publication, 283 pp.