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ABSTRACT BOOK

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Aristocystitidae (Echinodermata, Blastozoa): Systematic and taxonomic review

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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). Aristocystiid 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 aristocystiid 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 aristocystiid 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 aristocystiid *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 aristocystiid genera, such as *Glaphocystis*, *Phlyctocystis*, and *Maghabocystis*. 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 Diplopores (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 “Echinosphaerites”murchisoni Verneuil y Barrande, 1855 (Echinodermata, Diploporeta) del Ordovícico Medio centroibérico (España). *Geogaceta*, **27**, 83–86.
- Gutiérrez-Marco, J.C. & Aceñolaza, G.F. 1999. *Calix inornatus* (Meléndez, 1958) (Echinodermata, Diploporeta): morfología de la región oral de la teca y revisión 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.
- Makhlof, Y., Lefebvre, B., Nardin, E., Nedjari, A. & Paul, C.R.C. 2017. The diplopore 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 diplopore genus (Echinodermata) from the Llanddowror district, South Wales. *Geological Journal*, **54**(1), 529–536.
- Parsley, R.L. 1990. *Aristocystites*, a recumbent diplopore (Echinodermata) from the Middle and Late Ordovician of Bohemia, ČSSR. *Journal of Paleontology*, **64**, 278–293.
- Paul, C.R.C., 2018, *Prokopiush*, a new name for “*Hippocystis sculptus*” Prokop, 1965, and the status of the genus *Hippocystis* Bather, 1919 (Echinodermata; Diploporeta). *Bulletin of Geosciences*, **93**(3), 337–346.
- Paul, C.R.C. & Gutiérrez-Marco, J.C. 2020. *Enodicalix* (Diploporeta, 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, "Echinoderms de l'Ordovician 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, Diploporeta): 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.