

## Symmetry disorders of the test of the Miocene echinoid *Echinocyamus* from Poland

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This paper presents cases of disorders in the test symmetry in three species of *Echinocyamus* (*E. pusillus*, *E. calariensis*, and *E. apicatus*) from the Miocene deposits of Poland. It is the first study of this topic based on fossil material. The large collection (ca. 60 000 specimens) allowed distinction of several types of these rare disorders (14 specimens), which are illustrated by SEM and explanatory drawings. An example of a deformity formed on the pentamerous system is also presented. The deformations develop in the rudiment; consequently the apical system and the test of the mature individual which is formed at its margin display disorders. The anomalies most commonly appear as an additional growth zone (6-ray symmetry), lack of one growth zone (4-ray symmetry), or both deformations simultaneously (changed 5-ray symmetry). The changes appear in the apical system (number of ocular pores), test (number of petals), and peristome outline. The anomaly linked with the incorrect position of the periproct on the test surface, resulting from the delay of its displacement during early ontogenic stages, is characteristic and unique for such deformations.

**Key words:** Echinodermata, *Echinocyamus*, symmetry disorders, malformation, Miocene.

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