

The genus *Cyprideis* JONES, 1857 (Crustacea, Ostracoda) in the Neogene of Italy: a geometric morphometric approach

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The genus *Cyprideis* JONES, 1857 appeared in the Late Oligocene or Early Miocene of Germany with *Cyprideis traisensis* MALZ & TRIEBEL and since Miocene it widespread both in Eurasia and America. During Late Miocene it underwent a great adaptive radiation in the brackish environments of the Mediterranean and Paratethys domains, giving rise to several tens of species. Due to its adaptation to unstable brackish environments, *Cyprideis* is characterised by a strong polymorphysm linked to its ecophenotypical plasticity, as it is testified by the living species *Cyprideis torosa* (JONES, 1850), which displays several morphotypes (WOUTERS 2002). This ecophenotypical variability includes several valve features such as nodes, spines, tubercles, ornamentation and size (FRENZEL 1991; VAN HARTEN 1996, 2000; WOUTERS 2002; KEYSER 2004).

In the present paper a taxonomical revision of the Neogene Italian *Cyprideis* species is proposed using a geometric morphometric approach, following the methodology proposed by BALTANÁS et al. (2003) and BRAUNEIS et al. (2006) through the software MORPHOMATICA. The geometric morphometric analysis was applied on *Cyprideis* right female valves included in the original collection of DECIMA (1964), who described several Italian *Cyprideis* species, and from new material collected in the Tortonian–Messinian deposits of several Italian brackish basins.

The geometric morphometric analysis led to the distinction of at least six outline groups that were compared with the mean outline of *Cyprideis pannonica* (MEHÉS) and *Cyprideis tuberculata* (MEHÉS), collected from the early Pannonian of the Paratethys domain. These results, coupled with the classical morphometric analysis of the valves and carapaces (size, development of the median sulcus and of the anterior duplicature, dimension of the sieve-pores), allowed to recognize the absence of the two Paratethyan species from the Mediterranean domain and the validity of the following Italian *Cyprideis* species:

- *Cyprideis* sp. 1 n. sp.: Baccinello Basin, Valdelsa Basin. Age: middle Tortonian–early Messinian;
- *Cyprideis* sp. 2 n. sp.: Baccinello Basin. Age: middle Tortonian–early Messinian;
- *Cyprideis* sp. 3 n. sp.: Baccinello Basin. Age: middle Tortonian–early Messinian;

- *Cyprideis ruggierii* DECIMA, 1964: Pietracuta (Romagna), Cessaniti Basin, Velona Basin, Valdelsa Basin, Volterra-Radicondoli Basin. Age: late Tortonian–early Messinian;
 - *Cyprideis belfortensis* MOLINARI, 1962: Belforte (Siena), Volterra-Radicondoli Basin. Age: late Tortonian–early Messinian;
 - *Cyprideis* sp. 6 n. sp.: Volterra-Radicondoli Basin, Valdelsa Basin. Age: late Tortonian–early Messinian;
 - *Cyprideis* sp. 8 n. sp.: Velona Basin. Age: early Messinian;
 - *Cyprideis agrigentina* DECIMA, 1964 [including *C. pseudoagrigentina* DECIMA, 1964, *C. pannonica pannonica* sensu DECIMA (1964) from Formignano (Forlì) and *C. torosa* subsp. indet. from Eraclea Minoa (DECIMA 1964)]: widespread in the Lago-Mare biofacies of the whole Mediterranean area. Age: post-evaporitic Messinian;
 - *Cyprideis anlavauxensis* CARBONNEL, 1979: widespread in the Lago-Mare biofacies in France and Italy. Age: post-evaporitic Messinian;
 - *Cyprideis calabra* DECIMA, 1964 (including *C. tuberculata tuberculata* from Formignano (Forlì) and *C. cf. C. tuberculata* from Eraclea Minoa (DECIMA 1964): Formignano (Forlì), Belvedere di Spinello (CZ) and Irpinia. Age: post-evaporitic Messinian–Pliocene.
 - *Cyprideis crotonensis* DECIMA, 1964: Casabona (CZ). Age: Pliocene.
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