

María del Carmen R. Díez (*), Fritz H. Cramer (*).—MORPHOLOGY OF *Pseudoclathrochitina carmenchui* (CRAMER 1964), A CHITINOZOAN SPECIES FROM THE LUDLOVIAN OF SPAIN.

Pseudoclathrochitina carmenchui (CRAMER 1964) is a chitinozoan species found in numerous locations in the Cantabrian Mountains, Northern Spain. On stratigraphic considerations the chronological position of this species is placed in the Ludlovian, probably late Ludlovian, and it may range as high as the Lower Gedinnian. Stratigraphic data are not sufficient to precisize this range any further. Miospore assemblages from overlying sediments prove with certainty that the species disappears before the Siegenian. In other words, *P. carmenchui* attains abundance where, in the Cantabrian area, miospores begin to diversify and when the sedimentary area shallows up; its range begins after the disappearance of *Cyathochitina elenitae*, coincides with the acme of *Plectochitina carminae* and *Desmochitina urna* and also with the acme of *Geron guerillerus*. If *P. carmenchui* is facies-dependent, then its distribution pattern coincides with a peak in frequency of large green algae, *i. e.*, a lagoonal to shallowing tidal flat environment.

Morphologically, the species has a superficial similarity to a colonial form called «*Conochitina oelandica silurica*» TAUGOURDEAU 1963, and even more to a «subspecies» of *Linochitina cingulata* (EISENACK 1937), *viz.*, *L. c. serrata* (TAUGOURDEAU & DE JEKHOWSKY 1960). Transmitted light microscope pictures of these «species» are shown in Plate 1 : 1 - 16; stereoscan pictures in Plates 2 and 3. Especially when these taxa are opaque, fragmented or otherwise damaged, it becomes quite difficult to distinguish between these species with the transmitted light microscope in routine sample analysis. This has its drawbacks for chronostratigraphic precision.

Originally we thought that the single difference between *P. carmenchui* and *L. cingulata serrata* lay in the perforated *vs.* smooth keel. We have found now that there are a number of fundamental differences in sculpture and construction between these taxa. These differences are so profound that even small fragments of *P. carmenchui* remain well recognizable. Both taxa are discussed and re-illustrated in the systematic portion of this note. To summarize the main differences:

P. carmenchui

1. operculate
2. pseudostome crenulate to straight
3. no aboral callus
4. reticulate sculpture
5. perforate «keel» (continuation of reticulate sculpture)

L. cingulata serrata et al.

1. copulate
2. pseudostome straight
3. stolon/prosome construction
4. smooth (but with occasional «growth» striae)
5. solid keel (formed by attachment of pseudostome to succeeding specimen).

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Pseudoclathrochitina carmenchui (CRAMER 1964)

Pl. 1 : 3-6, 10, 11, 15, 16; 2 : 1-7; 3 : 6, 9.

- 1964 *Clathrochitina carmenchui*.—CRAMER: *Leidse Geol. Meded.*, vol. 30, p. 346, Pl. 22 : 8 - 10; 24 : 18*.
- 1966 *Pogonochitina carmenchui*.—TAUGOURDEAU: *Mém. Soc. Géol. France, N. S.*, vol. 45. pt. 1, Mém. 104, p. 427.
- 1966 *Pseudoclathrochitina carmenchuae*.—CRAMER: *Bull. Soc. belge Géol.*, vol. 75, p. 94, Pl. 3 : 61, 66.
- 1967 *Clathrochitina carmenchuae*.—CRAMER: *Bol. I. G. M. España*, nr. 77, p. 236.
- 1967 *Pseudoclathrochitina carmenchuae*.—CRAMER: *Not. Com. I. G. M. España*, vol. 94, pp. 45-52.

Pseudoclathrochitina is a monospecific genus at this time.

Original description and emendations.—«Collar transparent, smooth, with a simple boundary. Body chamber conical, somewhat convex, grading within very short distance into a perforated keel. The perforations show a roughly vertical lineation. The wall is not transparent, its surface is smooth; no internal structures observed.» (CRAMER 1964).

«(...) the organization and outline of *C. carmenchuae* are similar to those of *Eremochitina (Desmochitina) cingulata* (EISENACK 1937) (...) it frequently possesses an oral mucron. (...) The species is to accomodate taxa with vesicle outline and construction essentially similar to those of *Eremochitina cingulata*, but with a perforate cingulum and oral mucron. The numerous perforations in the cingulum are arranged in a more or less pronounced pattern parallel to the longitudinal vesicle axis. The cingulum does not form a set of grafted processes as found in some specimens of *Cyathochitina clathrata*, nor does it show anastomosing appendices as in *Plectochitina carminae*. Type species of the genus is «*Plectochitina carmenchuae* (CRAMER 1967)».

Dimensions.—Total length 100 to 210 microns; generally 140 to 180 microns; mode 160 microns.

Additional morphographic observations.—Although *P. carmenchui* has as yet not been found in coupled units, its morphology indicates that, as all other chitinozoans, it is a colonial form. Perhaps colonial forms are never preserved (as in *Conochitina proboscifera*) because the colonial habitus was present only in a youthful, presumably non-thecate stage of the chitinozoan organism. But at any rate, that single units of *P. carmenchui* may represent portions of a chain-colony, perhaps detached before the acquisition of a theca, is clear from the morphology of this species. The chain-colonies, whether thecate or not, must have followed a pattern, constructed much in the same manner as *L. cingulata*. This is clearly recognized: we find simple, non-colonial operculate forms, Pl. 2 : 2, 4; 3 : 9 and the inoperculate ones, Pl. 1 : 10, 15; 2 : 1, 3, 6; 3 : 6 which, presumably are portions of a disintegrated chain-colony. Neither of the two stages shows a stolon of the types seen in e. g., *Desmochitina urna* (Pl. 3 : 10), *Linochitina cingulata*... *L. erratica* (Pl. 1 : 9, 12-14), *Cyathochitina* sp. (e. g. in EISENACK 1968: Pl. 1 : 10). No callus or stolon is present.

Inoperculate forms may have a crenulate pseudostome boundary; it generally flares out (Pl. 1 : 10; 2 : 1) but may also be terminated along a straight line (Pl. 1 : 4, 5; 2 : 6).

