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A REVISION OF THE ORDOVICIAN TRILOBITE GENUS PLAESIACOMIA HAWLE & CORDA, 1847

ABSTRACT. *Plaesiacomia* Hawle & Corda, 1847 is redefined and additional data are adduced from Portuguese material of the French species *P. oehlerti* (Kerforne), which is redescribed. Differences between this species and the Bohemian *Plaesiacomia rara* Hawle & Corda are discussed; both species are considered to be generically distinct from *Colpocoryphe* Rouault, 1847, though the two genera are probably related.

In a recent paper Vaněk (1965) has discussed Bohemian trilobites customarily assigned to the genera *Plaesiacomia* and *Colpocoryphe*, and has concluded that they are congeneric. I disagree with his contention which apparently takes no account of differences between the type species of the two forms. In the present paper both genera are considered as being distinct and a fuller description of *Plaesiacomia* is given on the basis of newly-collected Portuguese material. I am indebted to Dr. Radvan Horný for permitting me to examine collections at the Národní muzeum, Prague; to Professor Decio Thadeu for introducing me to the geology of the Bussaco district, Portugal; and to Monsieur J-L. Henry for useful information regarding Breton species and material.

Superfamily CALYMENACEA Edwards, 1843

Family COLPOCORYPHIDAE Hupé, 1953

Genus PLESIACOMIA Hawle & Corda, 1847

Type species. *P. rara* Hawle & Corda, 1847, by monotypy.

Distribution. Occurs in the Caradoc Series, and perhaps Llandeilo Series, of France, Spain, Portugal, Bohemia and North Africa.

Plaesiacomia rara Hawle & Corda, 1847

Pl. 1, figs. 1—3, 6, 7

1847. *Plaesiacomia rara* Hawle & Corda, p. 55, pl. 3, fig. 30.

1852. *Homalonotus rarus* Corda sp., Barrande, p. 581, pl. 29, figs. 21, 22.

1872. *Homalonotus rarus* Corda sp., Barrande, p. 40, pl. 5, fig. 27.

1948. *Plaesiacomia rara* Hawle & Corda, Prantl & Přibyl, p. 19. Includes previous synonymy.

1956. *Plaesiacomia rara* Hawle & Corda, Šnajdr, p. 31.

A new description of the species was given by Prantl & Přibyl (1948, p. 19) who noted, for the first time, the presence of what they termed "circular elevations" near the glabella. They obviously referred to paraglabellar areas, but made no mention of a break in the continuity of the axial furrows to accommodate such structures, though this is seen in their illustration (1948, pl. 2, fig. 6). They referred also to one of "Barrande's syntypes", a pygidium with seven thoracic segments, but the specimen in question has no such status as the species was founded by Hawle & Corda, using a single cephalon. One of Barrande's illustrations of the glabella (1952, pl. 29, fig. 21) shows two faint pairs of glabellar furrows. These are not seen in the specimen figured in this paper (Pl. 1, figs. 1, 2), probably owing to its preservation in a relatively coarse matrix.

The thorax of *Plaesiacomia rara* is still not known in its entirety, and the most complete example available is that figured by Barrande (1872, pl. 5, fig. 27), now refigured as a cast (Pl. 1, figs. 3, 6). The attached pygidium seems to me to have been partially misinterpreted, though the preservation is poor and confirmatory evidence must await the discovery of additional specimens. Both Barrande's engraving and Prantl & Přibyl's description accepted the pygidium as being of small size with the axis extending to the smooth, evenly-curved margin, and Sdzuy (in Moore 1959, p. O. 458) has cited the small pygidium of *Plaesiacomia* as the feature distinguishing the genus from *Colpocoryphe*. In fact, the margin as shown by Barrande appears to represent the adaxial boundaries of a pair of shallow vincular furrows which run parallel, and close, to the true margin, near which the surface of the test declines steeply (see Pl. 1, fig. 6). The vincular furrows appear to meet posteriorly, though this cannot yet be demonstrated clearly, and are probably analogous to those found in *Plaesiacomia oehlerti* (see later), though less strongly developed than in that species.

Horizon and localities. Hawle & Corda's type specimen has not yet been traced, but was said to come from quartzites near Beroun, Bohemia. The type horizon was at one time thought to be that of the Drabov Quartzites, lowest subdivision of the Bohemian Caradoc Series, but Šnajdr (1956, p. 31) has shown that the species is confined to the succeeding Letná Beds, and suggests Děd, near Beroun, as the type locality.

Plaesiacomia rara has been recorded, as *Homalonotus*, from the Sierra Morena of Spain (see de Verneuil & Barrande, 1856, p. 32, pl. 23, fig. 2), but it is questionable whether the species is truly represented and as far as I am aware the only member of the genus yet known with certainty from the Spanish faunas is *Plaesiacomia oehlerti* (Kerforne), a cranidium of which is illustrated here from the Almaden district (see Pl. 3, fig. 3). *Homalonotus rarus* as recorded from Morocco by H. & C. Termier (1950, pl. 198, fig. 8) is too poorly illustrated for precise identification but closely resembles *Plaesiacomia*. No undoubted *P. rara* has yet been found outside Bohemia.

For convenience the discussion of the species of *Plaesiacomia* is placed after the section on *P. oehlerti*.

Plaesiacomia oehlerti (Kerforne, 1900)

Pl. 1, fig. 5; Pl. 2, figs. 2-4, 7, 8

1900. *Homalonotus (Plaesiacomia) oehlerti* Kerforne, p. 784, pl. 13, figs. 1, 2.
1908. *Homalonotus (Plaesiacomia) oehlerti* Kerforne, Delgado, pp. 25-30.

Description. The entire dorsal exoskeleton is more than one and a half times as long as broad, attaining its greatest breadth across the basal portion of the cephalon, approximately at the line of the posterior border furrow. The cephalon is sub-semicircular in outline with well rounded genal angles, only slightly convex transversely but a little more so longitudinally, and moderately arched-down frontally. All the available specimens have suffered varying amounts of dorsal compression but it is estimated that the basal breadth of the glabella must have been roughly half that of the cephalon. The glabellar outline is sub-trapezoidal, with the sides gently curved, convex outwards, and converging forwards at about 50 degrees to meet, at blunt, obtuse angles, the transversely straight frontal glabellar lobe which has a breadth less than half that of the base of the glabella. The uniform curvature of the axial furrows is broken posteriorly where they exhibit a slight abaxial concavity opposite the basal glabellar lobes, coinciding with the development of small paraglabellar areas, represented by sub-elliptical depressions of the fixigenae with long axes parallel to the axial furrows. There are three pairs of unequal glabellar lobes, the third or basal pair occupying two-fifths of the glabellar length. The second and first pairs of glabellar lobes are respectively two-thirds and one half (approximately) of the size of the basal pair, whilst the frontal glabellar lobe is trapezoidal in outline, occupying about one-sixth of the glabellar length. The glabellar lobes are separated by faint glabellar furrows arching inwards and backwards so as to leave a smooth median band one-third of the basal breadth of the glabella. A few Portuguese internal moulds show a suggestion of ovoid muscle impressions coinciding with the inner parts of the second and third glabellar furrows (see Pl. 2, fig. 7). The first glabellar furrows are even less well defined than the other pairs, sometimes becoming almost indiscernible, whilst all three pairs are shallower on the external than on the internal mould. The axial furrows are almost uniformly deep and narrow, continuous frontally with the similar preglabellar furrow. Only traces of hypostomal pits have been found. The portion of the exoskeleton in front of the glabella consists of a smooth strip whose breadth (*sag.*) at the axial line is about one-eighth of the length (*sag.*) of the glabella; thence it broadens (*exsag.*) so as to form a pair of rounded lobe-like projections, steeply declined forwards and longitudinally just outside the line of the anterolateral angles of the glabella. They bear a general resemblance to corresponding structures on the genus *Colpocoryphe* (see later), though they are less conspicuously developed, and, like the latter, had a vincular function during enrollment. As in *Colpocoryphe* there is no differentiation into anterior border and preglabellar field. The occipital ring is narrow (*sag.*), trapezoidal in plan, with transversely straight posterior margin, delimited by axial furrows which run backwards and outwards from the base of the glabella. The median length is one-sixth that of the glabella, and

the occipital ring is separated from the latter by a relatively broad (*sag.*) occipital furrow which flexes backwards slightly to accommodate the broadly-rounded posterior margins of the basal glabellar lobes. Immediately outside the axial furrows the posterior border is the same breadth (*exsag.*) as the occipital ring but becomes broader abaxially, its posterior margin describing a gentle curve. The posterior border furrow is broad and deep at the axial furrows, where it is positioned slightly behind the line of the occipital furrow; it then curves gently forwards abaxially, becomes narrower, and ends a short distance from the lateral margin. There is no lateral border and the librigenae are unfurrowed, almost quadrant-shaped, steeply declined laterally and with strongly-curved margins. The eyes are situated opposite the second glabellar lobes, and the palpebral lobes, which are only gently convex abaxially in plan and carry no palpebral furrows, stand slightly higher than the glabella, so that the surface of the fixigenae slopes gently inwards to the axial furrows. The visual surface is poorly known, though one specimen shows a few small facets, whilst beneath it is a poorly-defined eye platform. Eye ridges are not apparent. The anterior branches of the facial suture run in straight lines, nearly parallel to the axial furrows, until they almost reach the anterior margin; they then turn sharply inwards and meet frontally. The posterior branches are strongly curved, arching outwards from the eyes and then backwards to cut the cephalic margin in a gonatoparian position.

The hypostoma of *Plaesiacomia* sensu stricto has not previously been described or found in position, but a Portuguese specimen collected in association with a cephalon of *P. oehlerti* is provisionally regarded as belonging to that species (see Pl. 2, figs. 4, 5). The hypostoma, excluding anterior wings, is slightly longer than broad, narrowest frontally and notably expanded posteriorly. The anterior margin, continuous across the front of a pair of large, triangular, anterior wings, is transversely straight, and the narrow (*sag.*), rim-like anterior border is separated from the median body by a moderately-deep furrow. The anterior wings are flattened, deflected a little dorsally, and coalesce posteriorly with the thickened, raised, lateral border which, though incompletely preserved, appears to diminish posteriorly. The median body is divided into two lobes by a chevron-shaped median furrow which extends backwards and inwards from the lateral margins opposite the centre of the hypostoma, and becomes shallower towards and across the sagittal line. The anterior lobe is almost parallel-sided and occupies slightly less than two thirds of the maximum breadth of the median body, measured across the posterior lobe. The posterior lobe itself has a slightly bulbous appearance and is subcrescentic in plan with strongly convex lateral margins. The whole median body is fairly convex, the convexity increasing posteriorly. As far as can be seen the margin of the median body is entire and broadly rounded, but the posterior border of the hypostoma is not preserved.

The thorax consists of, probably, thirteen segments and has only poorly-defined longitudinal trilobation. The axis occupies slightly more than half the thoracic breadth and is gently arched transversely, stand-

ing only a little higher than the pleurae. Each axial ring is similar in plan to the occipital ring, that is to say trapezoidal in outline with the outer ends obliquely truncated so that the axial furrows have a serrated appearance. Each ring has a pair of small axial lobes and there is an apodemal pit in the axial furrow, just behind centre. A transversely straight, fairly deep, articulating furrow separates the axial ring from a relatively large articulating half-ring. In the accompanying photograph (Pl. 3, figs 1, 2), owing to flexing of the thorax, some segments are viewed obliquely, and so give the illusion of having the axial rings and articulating furrows arched gently backwards. Each pleura is transversely straight and parallel-sided as far as the fulcrum, where it turns downwards through almost a right-angle and curves forwards slightly to end in a blunt, rounded tip. A deep pleural furrow divides the inner half of the pleura into two bands, the posterior of which is slightly the larger, and then curves gently forwards beyond the fulcrum, becoming narrower and shallower, terminating without attaining the anterolateral margin of the pleural tip.

The pygidium is relatively small, almost transversely lozenge-shaped in plan when viewed with the axis horizontal; in this position the straight, lateral margins converge backwards at about 120 degrees. The axis is large, its frontal breadth slightly more than half the maximum breadth of the pygidium, and bounded by straight, moderately-deep axial furrows which converge backwards at about 25 to 30 degrees. Usually the axis is smooth or with no more than a suggestion of about two axial rings, but the articulating half-ring is delimited by a moderately-deep articulating furrow. The side-lobes are small, triangular in plan, and the anterior part of each carries a pleural furrow that is narrow and deep just outside the axial furrow but becomes shallower as it runs outwards and slightly backwards to the lateral margin. These pleural furrows delimit a pair of half-ribs, the anterolateral portions of which are steeply declined to form a pair of facets. A short distance inwards from the lateral margins, and running parallel to them, the dorsal surface carries a pair of furrows. Anteriorly these are truncated by the articulating facets, and posteriorly become slightly shallower as they indent the sides of the axis, the narrowed tip of which extends to the end of the pygidium, as well as truncating the axial furrows. It is clear that the furrows correspond to similar structures described in *Colpocoryphe* (see Dean, 1966). They had a vincular function and must have accommodated the margins of the librigenae during enrollment. At the same time as the librigenae overlapped the pygidial margins to rest in the vincular furrows, the indented frontal portion of the cephalon accommodated the correspondingly shaped tip of the pygidial axis. Such a method of enrollment could be taken to imply that the librigenae of *Plaesiacomia* and *Colpocoryphe* may have been capable of a small degree of flexibility, so that the librigenal margins overlapped the pygidial borders after the cephalon and pygidium had come into contact. Alternatively, the enrollment could have taken place in two stages. During the first of the there was enrollment of the thorax so that the underside of the pygidium made contact with that of the cephalon, but slightly to the rear of the final position. For the second stage the pygidium then

slid forwards (relative to the cephalon), the librigenal margins being guided by the pygidial vincular furrows, until the process was completed by the contact of the front of the cephalon and the tip of the pygidial axis. This second hypothesis may be the more convincing as it does not require any movement of the librigenae with reference to the remainder of the cephalon, but the evidence is, as yet, inconclusive.

Type material. Kerforne's species was founded on two syntypes, now in the Institut de Géologie, University of Rennes. One of these, the original of Kerforne, 1900, pl. 13, fig. 1, is chosen here as lectotype; it comprises a slightly compressed cranidium from Andouillé, Mayenne, Brittany, and is refigured now as a cast (Pl. 2, fig. 8). The other syntype, now paralectotype (Kerforne, 1900, pl. 13, fig. 2), is a slightly more distorted cephalon from Camaret, Brittany, showing the librigenae.

Horizons and localities. *Plaesiacomia oehlerti* was stated by Kerforne (1900, p. 785) to occur at a number of localities in Brittany, but the age of these specimens has not yet been described in modern stratigraphical terms, and it is not certain whether they correspond exactly to occurrences of the species in Portugal.

The Ordovician succession in the Bussaco district of Portugal was described and subdivided by Delgado (1908) whose results may be summarized as follows: —

- I. Diabasic shales with subsidiary limestones
- H. Diabase
- G. Shales with *Dalmanites dujardini* ROUAULT sp. (a species now assigned to *Kloucekia*)
- F. Grès de Loredo
- E. Shales with *Homalonotus oehlerti* KERFORNE (now *Plaesiacomia*)
- D. Shales with *Orthis ribeiroi* SHARPE
- C. Quartzites with *Bilobites*
- B. Sandstones with *Scolithus*
- A. Lower, red greywackes.

Delgado assumed that the Ordovician succession was complete and grouped his subdivisions as follows: Lower Ordovician (A—C), Middle Ordovician (D, E), Upper Ordovician (F—I). Although it would be inappropriate here to discuss the stratigraphy in detail, nevertheless it seems unlikely that the Ordovician is represented in its entirety. Subdivision E, the so-called "Schistes à *Homalonotus oehlerti*", overlies strata which, according to Delgado, contain *Didymograptus purchisoni*, a species indicative of the upper half of the Llanvirn Series. It would therefore be reasonable to postulate a Llandeilo age for the shales with *Plaesiacomia oehlerti*, assuming that the succession is continuous, but there is, as yet no confirmatory evidence. The other fauna recorded by Delgado from subdivision E is alleged to include *Calymene tristani* Brongniart (now *Neseuretus*), a species possibly of Llanvirn age in north-western France, and *Dalmanites socialis* Barrande (now *Dalmanitina*), a characteristic Caradoc species in Bohemia. The fauna is in need of revision but for the present a provisional Llandeilo age is accepted. The Portuguese spe-

cimens now figured are from the section by the north-eastern side of the Luso-Sazes road, about 1850 metres at 174 °T from the summit of the Serra de Bussaco, and the associated fauna includes both *Neseuretus* and *Dalmanitina* together with *Kloucekia*, a predominantly Caradoc genus.

The internal mould of a cranidium (Pl. 3, fig. 3) from Cerro de la Carcel near Almaden shows that *P. oehlerti* is represented in the central Spanish faunas.

Discussion. Both *Plaesiacomia rara* and *P. oehlerti* are small species, having generally similar proportions and with broadly comparable glabellar outlines. There are, however, conspicuous differences and there should be little likelihood of confusion between the two. The eyes of *P. rara* are placed notably far forwards, opposite the frontal glabellar lobe, whereas those of *P. oehlerti* are sited much farther back, opposite the basal glabellar furrows and the anterior part of the basal glabellar lobes. Consequently the posterior portions of the fixigenae of *Plaesiacomia rara* are conspicuously larger than those of *Plaesiacomia oehlerti*. The abaxial margins of the basal glabellar lobes of *P. rara* are straight, opposite weakly developed, apparently rounded, paraglabellar areas. On the other hand the abaxial margins of the basal lobes of *P. oehlerti* are concave outwards, opposite elongated paraglabellar areas. The pygidia of the two forms also exhibit certain differences, that of *P. rara* having the tip of the axis circumscribed by the confluent axial furrows, whilst the vincular furrows run close to the lateral margins. In *P. oehlerti* the axis is slightly less strongly tapered, bounded by axial furrows which become shallow towards, or are truncated by, vincular furrows situated at a moderate distance from the pygidial margins. Additional material may demonstrate still more differences.

In 1872 Barrande (p. 40) noted that a fragment of a trilobite analogous to "*Homalonotus rarus*", although three to four times larger, had been described by Eudes Deslongchamps as *Asaphus brevicaudatus*. The species was assigned by Bigot (1888 p. 433) to *Plaesiacomia* and, although not redescribed, has since been generally accepted as a member of that genus. *Asaphus brevicaudatus* was founded on material from the Grès de May of Normandy by Deslongchamps (1825, p. 515, pl. 20, figs 2—4) who illustrated three specimens, a pygidium and two cranidia, one of which he reserved and interpreted as a pygidium. All may be regarded as syntypes. In view of Deslongchamps' choice of specific name it is appropriate that the pygidium (*loc. cit.*, pl. 20, fig. 4) should now be chosen as lectotype. Topotype material shows that Deslongchamps' illustration, though crude, is sufficiently accurate to be identifiable, and that the pygidium resembles that of *P. rara* in some respects, namely the general outline and the plan of the axis. There are, however, significant differences, and the tip of the axis is not defined, whilst the vincular furrow, though absent from its customary position, is represented by a broad, shallow groove which is set below and inside the pygidial margin and separates it from the narrow doublure. Consequently the species is here questionably assigned to *Plaesiacomia*. Although *P.?* *brevicaudata* is known only from disarticulated fragments it is likely that Deslongchamps

was correct in his grouping of pygidium and cranidium, even though one of the latter was thought by him to be a pygidium. The cranidium is much larger than that of either *P. rara* or *P. oehlerti*, and can also be distinguished by its narrower glabella, the anterior third of which is almost parallel-sided, as well as by the lack of anterolateral projections of the anterior area.

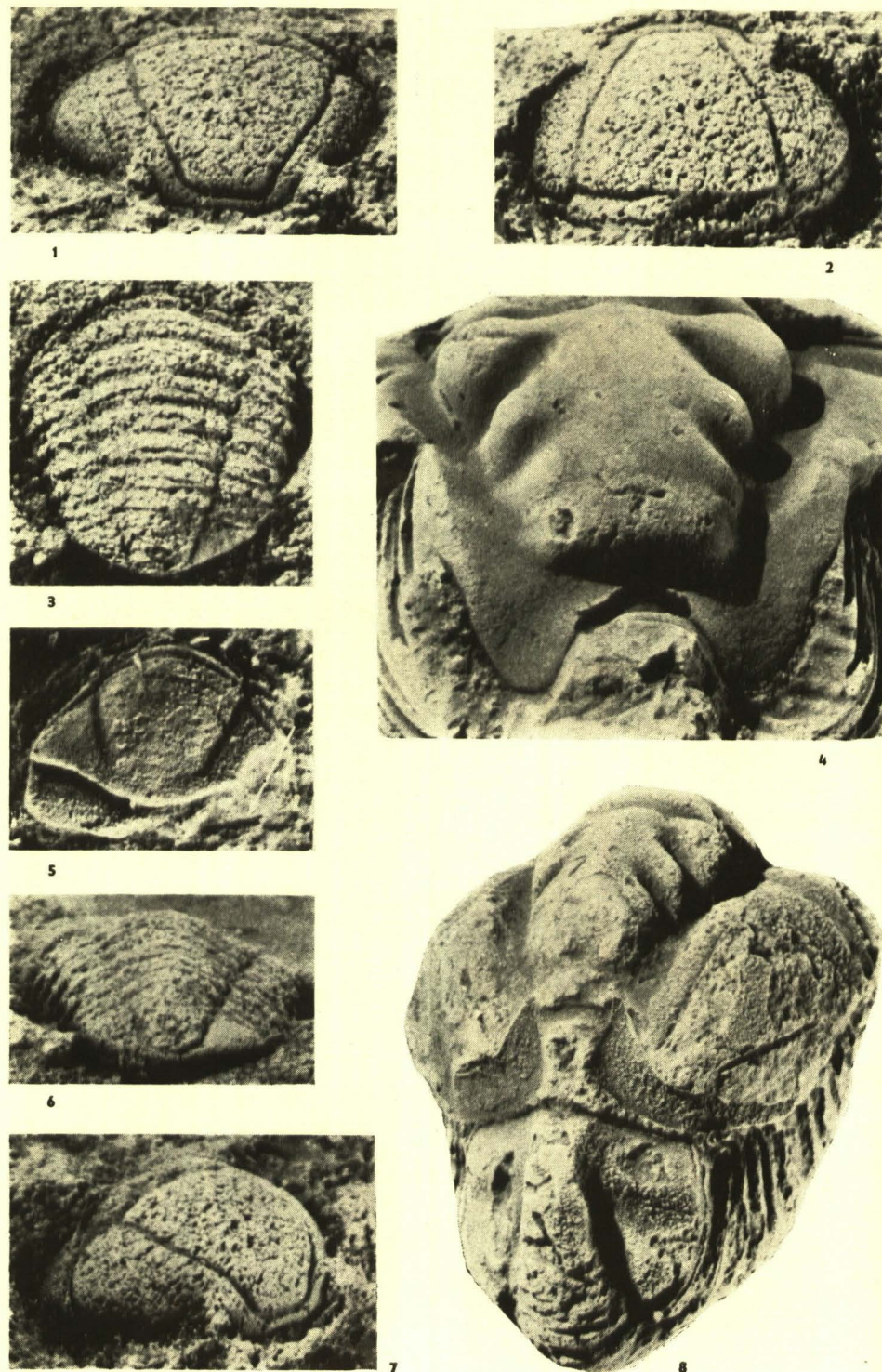
The Llandeilo and, probably, lowest Caradoc Series of Bohemia, France, North Africa and the Anglo-Welsh area provide evidence of a marked abundance of trilobites of homalonotid type, including the genera *Plaesiacomia*, *Brongniartella*, *Calymenella* and *Eohomalonotus* (the last two are sometimes regarded as synonymous or of subgeneric status, but are not reviewed here). This abundance of both genera and species is associated as a rule with arenaceous deposits such as the Drabov and Letná Beds (Bohemia), the Grès de May and Grès du Glauzy (France), and the Hoar Edge Grits (England). This may indicate a certain preference for shallow-water conditions, but could also be equated with the widespread marine transgressions occurring in this part of the Ordovician.

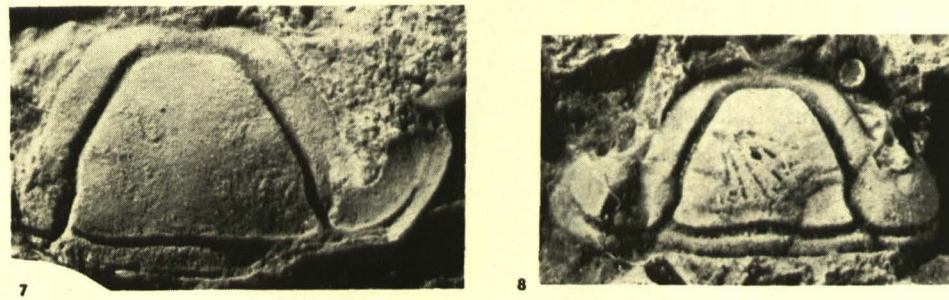
Genus COLPOCORYPHE Novák in Perner, 1918

The type species was first described by Rouault (1848, p. 88, pl. 2, fig. 3) as *Calymene arago* [often misquoted as *aragoi*], and founded on material from La Couyère, Brittany. A single, large individual was figured and may be regarded as holotype. Monsieur J—L. Henry kindly informs me that the type-material has not yet been traced, and that the type-locality, known more generally as Riadan, is unlikely to yield additional topotypes. Consequently I believe the binomen *Colpocoryphe arago* should be restricted to the holotype as interpreted from Rouault's illustration, at least until the species can be redescribed satisfactorily. The age of the holotype is, according to Monsieur Henry [personal communication], Caradoc Series. The specific name has been applied indiscriminately at various times to what are doubtless several distinct species of *Colpocoryphe* and the range of the genus, as at present known, is from the Arenig to Caradoc Series.

In spite of the difficulties posed by the type material, the salient features of the genus are seen clearly in Rouault's illustration, and it is surprising to find Vaněk (1965, p. 24) regarding *Colpocoryphe* and *Plaesiacomia* as congeneric. Admittedly the two have certain features in common, for example, both have a median notch in the frontal margin of the cephalon, and vincular furrows on the dorsal surface of the pygidium. The resemblances are, however, more than outweighed by the differences, which are shown below.

Pl. I.





EXPLANATION OF PLATES

PLATE 1

Plaesiacomia rara Hawle & Corda

Figs 1, 2, 7. Anterior, plan and anterolateral views of cast of cranidium. Národní muzeum, ČD 693 (pars), ×8.

Figs 3, 6. Plan and posterior views of cast of pygidium with incomplete thorax. Národní muzeum, ČD 693 (pars), ×8.

Both the above specimens, from the Letná Beds of Mount Drabov, Bohemia, were figured in association by Barrande (1872, pl. 5, fig. 27).

Colpocoryphe sp.

Fig. 4. Anterior view of internal mould of cranidium. Brit. Mus. (Nat. Hist.), Bather Coll., I. 15396, ×5.

Fig. 8. Anterolateral view of almost enrolled individual, illustrating pygidium immediately prior to engagement with ventral side of cephalon.

Brit. Mus. (Nat. Hist.), Bather Coll., I. 15395, ×3.

Both specimens are from the Llandeilo (?) Series, Bain de Bretagne, Ille-et-Vilaine, France.

Plaesiacomia oehlerti (Kerforne)

Fig. 5. Internal mould of pygidium. Part of the right side has been removed to show the inner margin of the doublure (indicated by arrow). Brit. Mus. (Nat. Hist.), In. 58749, ×11. „Schistes à *Homalonotus oehlerti*“ (Llandeilo (?) Series), north-eastern side of road from Luso, 1850 metres at 174 °T from summit of Serra de Bussaco, Portugal.

PLATE 2

Colpocoryphe bohemia (Vaněk)

Figs. 1, 6. Anterior and plan views of internal mould of cranidium. Brit. Mus. (Nat. Hist.), In. 31931, ×3, Šárka Beds (Llanvirn Series), Osek, near Rokycany, Czechoslovakia.

Plaesiacomia oehlerti (Kerforne)

Fig. 2. Internal mould of pygidium showing vincular furrow. Brit. Mus. (Nat. Hist.), In. 58748, ×5.

Fig. 3. Internal mould of cephalon showing librigena and palpebral lobes. I. 58734, ×7.

Figs. 4, 5. Internal mould of cephalon and associated hypostoma. In. 58735. Fig. 4, ×5. Fig. 5, hypostoma only, ×11.

Fig. 7. Internal mould of cranidium showing muscle impressions at inner ends of glabellar furrows. In. 58751, ×7.

Horizon and locality as for Pl. 1, fig. 5.

Fig. 8. Cast of lectotype cranidium figured by Kerforne, 1900, pl. 13, fig. 1. Llandeilo (?) Series. Andouillé, Mayenne, France. Original in University of Rennes. ×8.

PLATE 3

Plaesiacomia oehlerti (Kerforne)

Figs. 1, 2, 4, 5. Plan, right lateral, posterior and anterior views of dorsal exoskeleton exhibiting eleven segments of thorax. Brit. Mus. (Nat. Hist.), In. 58726, ×9. Horizon and Locality as for Pl. 1, fig. 5.

Fig. 3. Internal mould of incomplete cranidium from Cerro de la Carcel d'Almaden, Spain. Horizon presumably similar to that of other examples of the species. Brit. Mus. (Nat. Hist.), I. 4811, ×5.

Colpocoryphe

Cephalon and glabella strongly convex.

Glabellar furrows strongly developed.

Axial furrows deep and broad.

Glabellar outline typically bell-shaped, the sides gently convergent forwards, with frontal lobe standing well above preglabellar area.

Vincular notch strongly developed at front of cephalon.

Paraglabellar areas not usually seen.

Strong eye-ridges present.

Pygidial axis high, convex, well segmented.

Margins of pygidium moderately divergent forwards.

Large vincular furrows run through mid-points of sidelobes and parallel to margins.

Plaesiacomia

Cephalon and glabella only gently convex.

Glabellar furrows weakly developed, almost obsolete.

Axial furrows narrow and shallow.

Sides of glabella converge forwards strongly to low frontal lobe.

Vincular notch shallow.

Paraglabellar areas developed, sometimes strongly.

Eye-ridges not seen.

Pygidial axis broad, low, almost smooth.

Margins of pygidium widely divergent forwards.

Vincular furrows narrow, close to margins of pygidium.

The hypostoma of *Plaesiacomia* is known from only a single specimen, but this has some features (namely a relatively narrow anterior lobe and a broad crescentic posterior lobe, separated by a median furrow which is concave forwards in plan) in common with the hypostoma of *Colpocoryphe*, and the structure may prove useful in confirming a family relationship between the two genera.

Species assigned, at least provisionally, to *Plaesiacomia*.

P. rara HAWLE & CORDA, Caradoc Series, Bohemia.

P. oehlerti (KERFORNE), Llandeilo? Series, north-western France, Portugal Spain, ? North-Africa.

P.? *brevicaudata* (DESLONGCHAMPS), Caradoc Series, north-western France.

Species assigned to *Colpocoryphe*

C. arago (ROUAULT), Caradoc Series, north-western France.

C. bohemia (VANĚK), Llanvirn Series, Bohemia.

C. exsul WHITTINGTON, Llanvirn? Series, eastern North America.

C. grandis (ŠNAJDR), Llandeilo & Caradoc Series, Bohemia.

C. inopinata (NOVÁK in PERNER), Llanvirn Series, Bohemia.

C. lusitanica (THADEU), Llanvirn? Series, Portugal.

C. salteri (ROUAULT), horizon uncertain, possibly Llanvirn Series, north-western France, Portugal.

C. thoralis DEAN, Arenig Series, south-western France.

C. transiens (de VERNEUIL & BARRANDE), horizon uncertain, Spain and Portugal.

These exclude various records of *Colpocoryphe*, customarily referred to *C. arago*, which may prove, after revision, to belong to other species.

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