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On the presence of the phacopid trilobite *Omegops* in the uppermost Famennian of northern France (Avesnois)

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ABSTRACT

The latest Famennian (Strunian) trilobite faunas of the Avesnois area (northern France) document the final phase of diversification of Phacopidae in shallow inner shelf environments prior to the latest Devonian–Carboniferous Hangenberg extinction preceding the Devonian–Carboniferous boundary. This study revisits historical material from the Étrœungt Formation assigned to *Omegops bergicus*, together with a newly collected specimen from the abandoned Parcq Quarry, here described as *Omegops paucilenticulatus* sp. nov. The new species documents localized morphological diversification within *Omegops* in the Dinant Synclinorium (Belgium, France) and supports the taxonomic validity of *O. bergicus*. This work highlights the importance of detailed morphological characters, especially those related to eye structure and cephalic morphology. Such features are shown to be essential for reliable species-level identification among occulated phacopids of the uppermost Famennian.

KEYWORDS

Trilobita,
Phacopida,
Upper Devonian,
Strunian,
Hauts-de-France

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1. Introduction

The uniqueness of the marine fauna known from the top of the Devonian in shallow-water environmental settings did not escape the attention of Jules Gosselet (1832–1916), a French geologist who was the first to notice the presence of faunal elements in latest Famennian rocks (e.g. Gosselet, 1857, 1860). His discovery was made at the Parcq Quarry, near Étrœungt in the Avesnois area (northern France) (Fig. 1). This locality later became the type area of the Strunian substage (e.g. de Lapparent, 1900; Barrois, 1913; Streel et al., 2006), which is the uppermost of the four subdivisions of the Famennian Stage (e.g. Streel, 2005). The base of the Strunian is not yet formally defined but is generally considered equivalent to the base of the *Bispathodus ultimus* conodont Zone (Hartenfels & Becker, 2018; see also Denayer et al., 2021).

Since the second half of the 19th century, pioneering geologists reported the presence of phacopid trilobites within the limestones and shales (Étrœungt Formation), which are now assigned to the Strunian (e.g. Hébert, 1855; Gosselet 1857, 1860, 1871, 1879, 1880, 1888). Dehée (1929) described the invertebrate faunas from the Strunian of the Avesnois based on material collected by Gosselet, Delépine, and Carpentier, complemented by his own sampling. He was the first to illustrate the Strunian phacopids of the Avesnois area. These are among the last representatives of a once-flourishing order, which became extinct during the Hangenberg Crisis near the Devonian–Carboniferous Boundary (Bault et al., 2022).

It is worthwhile to remind here that Dehée's (1929) monograph is based on material poorly stratigraphically constrained, and some faunal elements were likely not from the Strunian, notably the atrypide brachiopods (probably Frasnian; Copper, 1986) and some athyridides (likely lower Famennian; Mottequin & Brice, 2016).

Recently, Crônier et al. (2025) illustrated two uppermost Famennian (Strunian) phacopid trilobites from southern Belgium, identified as *Omegops accipitrinus* (Phillips, 1841) and *O. maretiolensis* (Richter & Richter, 1933). These Belgian trilobites should have been compared with *O. bergicus* (Drevermann, 1902), which has been found in the Avesnois area.

To address this lack of comparative data between these *Omegops* species evolving in different sedimentary areas of the Dinant Synclinorium (Fig. 1), this note aims to compare the Belgian *O. maretiolensis* and *O. accipitrinus* with specimens from the Avesnois area, i.e. *Omegops bergicus* described by Dehée (1929) and *Omegops paucilenticulatus* sp. nov., and to justify the synonymy list proposed by Crônier et al. (2025).

2. Geological setting

Since Dehée (1929), latest Famennian trilobites from the Avesnois area have not been documented in detail; later reports consist only of brief mentions lacking both description and illustration (e.g. Malvesy et al., 1999; Mistiaen et al., 2013). Recently, an additional *Omegops* specimen has been discovered during a field excursion in scree at the disused Parcq Quarry (also referred to in earlier literature as the Parc Quarry), near Étrœungt (see Mistiaen et al. (2013, figs 1, 3) for detailed location), in the western part of the Dinant Synclinorium (Fig. 1). This quarry constitutes the historical type section of the *calcaire d'Œtrœungt*, first described by Gosselet (1857). The original spelling used by Gosselet (1857) was soon replaced by *calcaire d'Étrœungt* in a subsequent publication (Gosselet, 1860), and this revised form was rapidly adopted (see review in Mistiaen et al., 2013). This carbonate unit gave its name to the Étrœungt Formation, but it only represents the upper part of the Formation. The latter also includes siliciclastics deposits in its lower part (e.g. Conil, 1964; Mottequin et al., 2024).

At the Parcq Quarry, the lower part of the succession displays limestone beds rich in massive stromatoporoids but the carbonate beds become progressively thinner upwards, while the shaly beds increase in both thickness and frequency (e.g. Conil, 1964; Mistiaen et al., 2013). However, as notably stressed by Mistiaen et al. (2013), the base and top of the *Calcaire d'Étrœungt* are not exposed at the Parcq Quarry where its total thickness exceeds 25 m (Conil, 1964; Mistiaen et al., 2013). In the nearby Avesnelles section (Fig. 1), the total thickness of the Étrœungt Formation reaches 40 m (Conil, 1964).

For the lithological column of the Parcq Quarry and the distribution of macroinvertebrates (e.g. brachiopods, particularly the key markers *Sphenospira julii* and *Prospira struniana*, corals, trilobites), the reader is referred to Mistiaen et al. (2013), Brice et al. (2013) and Mottequin & Brice (2016).

The Étrœungt Formation is also known in south-western Belgium (Dinant Synclinorium) and passes laterally eastwards to the Comblain-au-Pont Formation (Denayer et al., 2021;

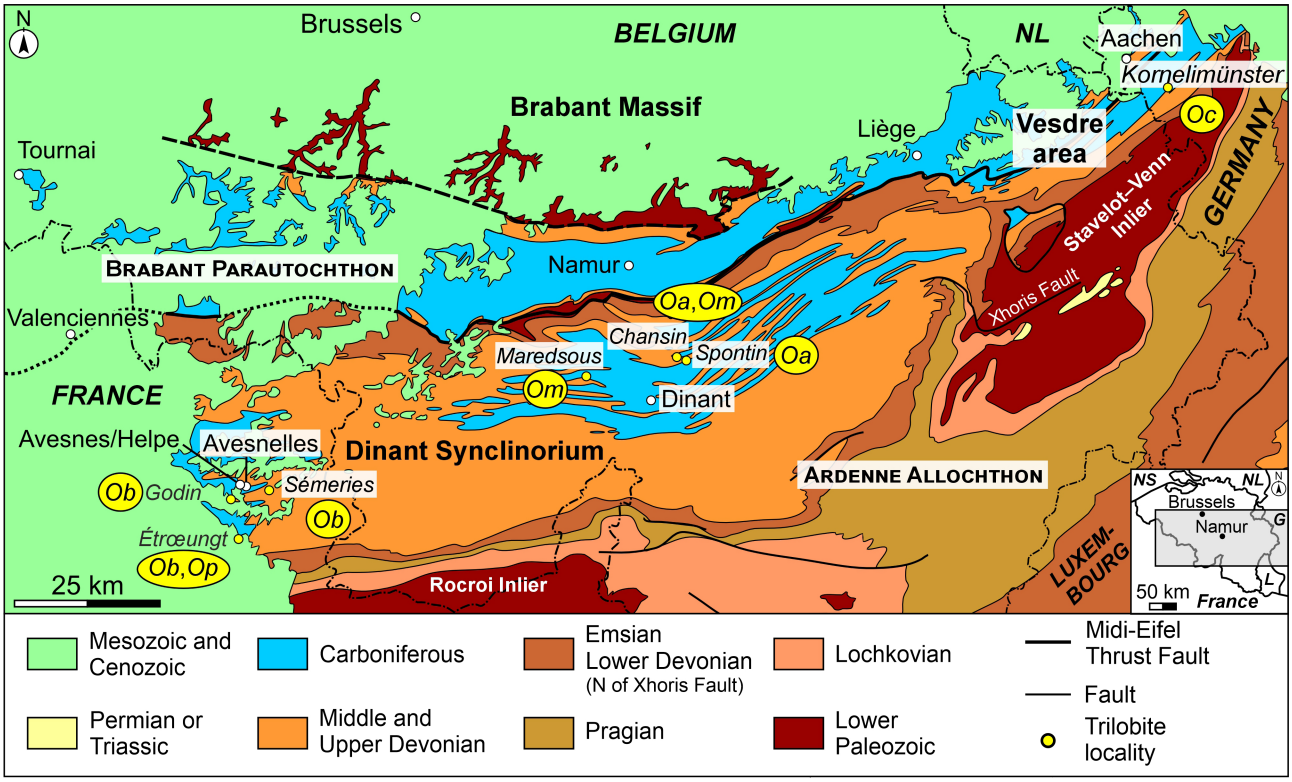

Figure 1. Location of the Dinant Synclinorium and schematic geological map of southern Belgium and adjacent countries (modified from de Béthune 1954; adapted from e.g. Candela & Mottequin, 2022) with documented occurrences (drawings, photographs) of latest Famennian (Strunian) phacopid trilobite species (see Dehée, 1929; Richter & Richter, 1933; Struve, 1976; Weber, 2000; Mottequin, 2021; Crônier et al., 2025; this work). Abbreviations of the inset: G, Germany; L, Luxembourg; NL, the Netherlands; NS, North Sea. Abbreviations of the phacopid species: *Oa*, *Omegops accipitrinus* (Phillips, 1841); *Ob*, *O. bergicus* (Drevermann, 1902); *Op*, *O. paucilenticulatus* sp. nov.; *Oc*, *O. cornelius* (Richter & Richter, 1933); *Om*, *O. maretiolensis* (Richter & Richter, 1933).

Mottequin et al., 2024), which has yielded numerous *Omegops* specimens (e.g. Richter & Richter, 1933; Crônier et al., 2025).

3. Material and methodology

The Dehée (1929) material is curated at the Musée d'Histoire naturelle de Lille (prefixed MGL used for the Gosselet collections) and has been exceptionally illustrated. A newly collected specimen is housed at the Évo-Éco-Paléo UMR of the Université de Lille (USTL). All specimens were lightly coated with magnesium oxide prior to photography using a Nikon digital camera.

4. Systematic palaeontology

Order Phacopida Salter, 1864
Superfamily Phacopoidea Hawle & Corda, 1847
Family Phacopidae Hawle & Corda, 1847
Subfamily Phacopinae Hawle & Corda, 1847
Genus *Omegops* Struve, 1976

Type species. Calymene accipitrina Phillips, 1841; from the Upper Devonian Pilton Beds, England.

Species assigned. See Crônier et al. (2025).

Remarks. Drevermann (1902) originally described *Omegops bergicus* as a new species from the upper Famennian of Germany (Ratingen and Velbert, near Düsseldorf; see Herbig, 2016, fig. 1). Richter & Richter (1933) reassigned these specimens to *O. accipitrinus* whereas they erected a new German species, i.e., *O. cornelius*, for those from Kornelimünster, near Aachen (Fig. 1). Subsequently, Struve (1976) maintained the taxon *bergicus*, whose differences appear to have greater taxonomic significance than previously assumed by Richter & Richter (1933).

Weber (2000) confirmed the reassignment of Drevermann's specimens from Kornelimünster to *Omegops cornelius*, and illustrated a specimen from this locality; the only known specimen available, as the holotype and paratypes were lost during the World War II.

Dehée (1929, p. 11–14, pl. 1, figs 1–9) described and assigned a few specimens from the uppermost Famennian of northern France (Étrœungt area) to *Omegops bergicus.* Richter & Richter (1933) subsequently reassigned the French specimens to *O. maretiolensis.* Later, Malvesy et al. (1999, p. 160) reassigned them to *O. accipitrinus* without providing a new description, illustration, or discussion. Fortunately, the opportunity to re-examine and illustrate the Dehée specimens has allowed us to refine their description and to confirm *bergicus* as a valid species, as proposed by Struve (1976).

***Omegops bergicus* (Drevermann, 1902)**
(Figs 2a–o, 4b, 5)

1902 *Phacops bergicus* Drevermann, p. 487–490, pl. 14, figs 1–4 [from Velbert, Ratingen] [excl. *Phacops* sp. Dantz, 1893; specimens from Kornelimünster].
1929 *Phacops bergicus* Drevermann, 1902; Dehée, p. 11–14, pl. 1, figs 1–9.
1976 *Phacops* (*Omegops*) *bergicus* Drevermann, 1902; Struve, p. 435, figs 3, 14, 21, 29, pl. 2, figs 10–12 [from Ratingen].
1993 *Phacops* (*Omegops*) *accipitrinus bergicus* (Drevermann, 1902); Brauckmann et al., p. 511, fig. 9.
1999 *Phacops* (*Omegops*) *accipitrinus accipitrinus* (Phillips, 1841); Malvesy et al., p. 160.

Type material. Lectotype SMF 79927 (Basse & Weddige, 2004), housed at the Senckenberg Naturmuseum (Frankfurt), from the upper Famennian of Ratingen, near Düsseldorf (Germany).

Studied material. Four cephala, including one previously illustrated by Dehée (1929, pl. 1, figs 7–8); two thoracopygidia illustrated by Dehée (1929, pl. 1, figs 4, 9); and one pygidium illustrated by Dehée (1929, pl. 1, fig. 6), all from the Étrœungt Formation at the Parcq Quarry, France. In addition, one thoracopygidium illustrated by Dehée (1929, pl. 1, fig. 5) from Sémeries, and one cephalon illustrated by Dehée (1929, pl. 1, fig. 1) from Godin, a locality near Avesnes (Avesnois, northern France). The thoracopygidium illustrated by Dehée (1929, pl. 1, fig. 3) has not been located and appears to be lost.

Emended diagnosis (from Drevermann, 1902 and supplemented by Struve, 1976). Cephalon wide; glabella bounded by divergent axial furrows at about 60°; L1 reduced (sag.) with two small granules medially; lateral preoccipital lobes elongated; reniform visual complex with 15–16 vertical lens files and up to 5 lenses per file; inter-lensar sclera thickened especially dorsally; subocular area wide with coarse tubercles and narrowing towards the front of the eye; postocular pad abaxially with several coarse and contiguous tubercles; short postocular area adaxially (about half the length of the posterior border). Pygidium rather long with a long pygidial axis, composed of 8 clear rings plus the terminal piece; pygidial pleural field with 6 well-defined ribs; deep pleural furrows; indistinct interpleural furrow. Coarse pustular and dense tubercles lacking granules on cephalon. Blunt tubercles on the lateral border.

Remarks. Dehée (1929) described few specimens from several localities of the Avesnois area (Fig. 1) that he assigned to *Omegops bergicus*. They are part of the former Musée d'Histoire naturelle de Lille (Malvesy et al., 1999). According to Dehée's (1929) original description, these specimens are characterized by a moderately convex glabella, ornamented with coarse granules arranged roughly in a quincunx pattern, which are well marked in the posterior part and become more rounded and smaller toward the front. The eyes bear approximately 50 lenses arranged hexagonally. Additional features include small tubercles on the palpebral lobe, a broad posterolateral depression below the eye, vague and barely visible granulation, and small tubercles on the postocular pad. The pygidium of these French specimens has eight axial rings (plus the terminal piece) and six pleural ribs.

Fortunately, the opportunity to re-examine and illustrate the Dehée specimens has allowed us to refine the description published in 1929. Two specimens (pl. 1, figs 1, 7 in Dehée, 1929; Figs 2a–d, 4b) show a visual surface with 15 dorso-ventral files of lenses—one with 60–61 lenses and the other with 65–68 lenses. Subocular librigenal field is distinct at the back of the eye with tubercles forming a subocular pad, fading towards the front of the eye. Pits and subdued tubercles are present on the lateral border and the intersclera are relatively thick dorsally only. Contrary to Dehée's (1929) description, a broad posterolateral depression below the eye bears several tubercles, and coarse and contiguous tubercles are present on the postocular pad.

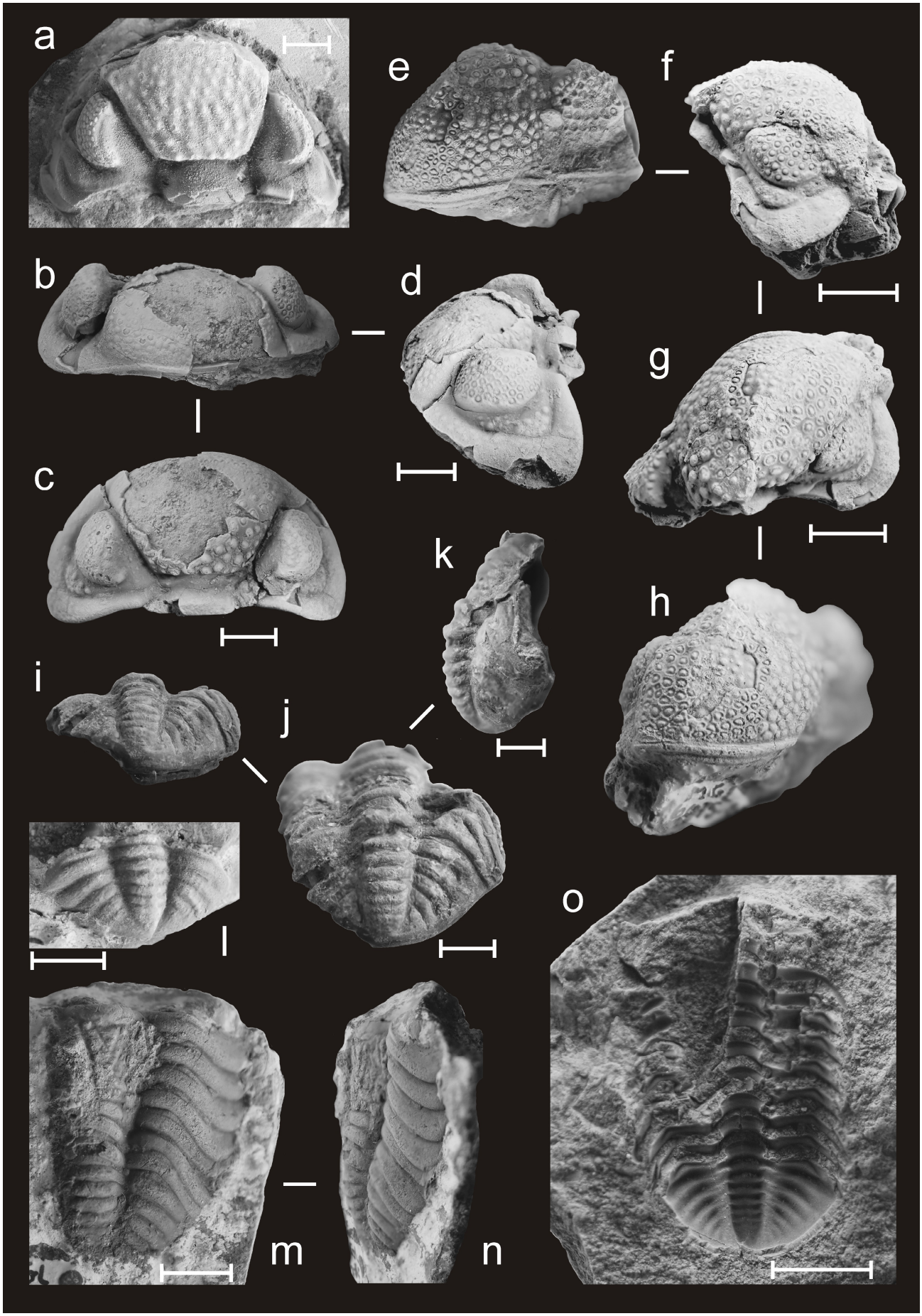

Figure 2. Phacopid trilobites from the Avesnois area, northern France; all specimens are from the disused Parcq Quarry, near Étrœungt, Étrœungt Formation (latest Famennian, Strunian), except specimens MGL6076 from Sémeries and MGL6110 from Godin (near Avesnes) (see Fig. 1). **a–o** *Omegops bergicus* (Drevermann, 1902). **a** Cephalon in dorsal view (MGL6110, pl. 1, fig. 1 in Dehée, 1929). **b**–**d** Cephalon in frontal, dorsal and lateral views (MGL6074.1, pl. 1, figs 7–8 in Dehée, 1929). **e**–**h** Cephalon in frontal, lateral and dorsal views (MGL6075-2, not figured in Dehée, 1929). (continued on the next page)

Discussion. The specimens described by Dehée (1929) from the disused Parcq Quarry are consistent in both cephalic and pygidial morphology with taxa originally described from the upper Famennian of Ratingen (Germany). They exhibit a wide cephalon (rather narrow in *Omegops accipitrinus*, *O. maretiolensis* and *O. cornelius*); the posteriormost edge of the eye does not reach the posterior border furrow and is about half the length of the posterior border. The subocular pad displays coarse tubercles (as in *O. cornelius* but absent in *O. accipitrinus* and *O. maretiolensis*, which show only a few granules), and the lateral border bears blunt tubercles and numerous pits (no tubercles in *O. accipitrinus*, a row of coarse ones in *O. maretiolensis*). Moreover, in lateral view, the glabella appears less prominent than in *O. accipitrinus*. The outline of the pygidium also appears similar, with a reduced border as illustrated in Struve (1976, pl. 2, fig. 12). This examination supports the validity of *bergicus* as a distinct species. Moreover, Struve (1976, p. 436, 445) characterised the *O. bergicus* lectotype as having 16 dorsoventral files. This apparent difference between the French and the German specimens of *O. bergicus* is regarded here as minor intraspecific variation.

Occurrence. Famennian (do VI), northern France and western Germany.

***Omegops paucilenticulatus* sp. nov.**
(Figs 3a–c, 4a, 5)

Derivation of name. The name comes from Latin *pauci* (meaning "few") and *lenticulatus* (meaning "lenticulate").

Type material. One single cephalon (Holotype PQ/Fa/Av_USTL 5363; Fig. 3a–c), recovered from a calcareous scree of the disused Parcq Quarry (Étrœungt, northern France), Étrœungt Formation (uppermost Famennian, Strunian).

Studied material. Only the holotype is available for study.

Diagnosis. Cephalon narrow; glabella bounded by weakly divergent axial furrows; L1 with few tubercles; reniform visual complex with 15 vertical lens files and maximum three lenses per file; inter-lensar sclera thickened dorsally; subocular area as an expanded furrow; postocular pad with tubercles. Coarse pustular and dense tubercles on the cephalon. Dominant pits and subdued tubercles on the lateral border.

Description. **Cephalon:** Narrow, reaching c. 23 mm in width and c. 15 mm in length; width ratio c. 0.63. **Dorsal view:** Glabellar ratio of width at L1/maximum width of frontal lobe c. 0.53, wide at the base. Glabella lowered, bounded by relatively deep axial furrows that are weakly divergent (56°). Frontal outline parabolic anteriorly. Frontal lobe barely overhanging a distinct preglabellar furrow. S2 and S3 indistinct. S1 continuous and hardly curved in its middle part, subparallel to S0, becoming deeper in its distal portions. L1 shorter (sag.) than L0 (half the length of L0), with a wide (tr.) median portion relative to its total width. Median portion of L1 slightly inflated, with few tubercles. L1 with slightly transverse lateral lobes, separated from its median part by a weak exsagittal furrow. S0 distinct, almost transverse. L0 relatively short (tr.), with lateral lobes not defined. Reniform visual surface, with 15 dorso-ventral files of lenses and a maximum of three lenses per file (exceptionally up to four lenses in one file; 41 lenses in total; Fig. 4a), and anteriorly depressed. Inter-lens sclera rather thickened dorsally and slightly thinner ventrally. Palpebral furrow distinct and strongly convex (abax.). Exsagittal length of the postocular genal field about half the length (exsag.) of the posterior border. **Lateral view:** Glabella sloping obliquely and then dorsoventrally in its anterior part. Outline of L1 slightly curved. L0 as high as the glabella at its maximum convexity. Anterior border short, ridge-like, projecting slightly forwards. Marginulation extending virtually to the genal angle. Posterior border furrow moderately deep and wide. Lateral border furrow narrow and moderately shallow at the front of the eye, becoming narrower towards the back. The lateral border

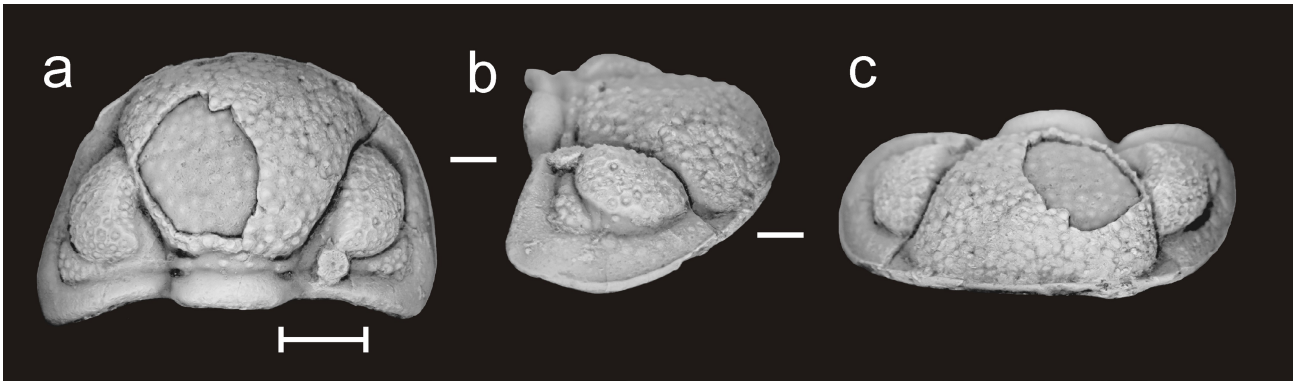

Figure 3. Phacopid trilobite from the Avesnois area, northern France; disused Parcq Quarry, near Étrœungt (see Fig. 1), Étrœungt Formation (latest Famennian, Strunian). **a–c** *Omegops paucilenticulatus* sp. nov., cephalon in dorsal, lateral and frontal views (holotype, PQ/Fa/Av_USTL 5363). Scale bar: 5 mm.

Figure 2. (continued). **i–k** Thoracopygon frontal, dorsal and lateral views (MGL6076, pl. 1, fig. 5 in Dehée, 1929). **l** Pygidium in dorsal view (MGL6077-a, pl. 1, fig. 6 in Dehée, 1929). **m**–**n** Thoracopygon in dorsal and lateral views (MGL6075-1, pl. 1, fig. 4 in Dehée, 1929). **o** Thoracopygon counterpart in dorsal view (MGL6078, pl. 1, fig. 9 in Dehée, 1929). Scale bars: 5 mm.

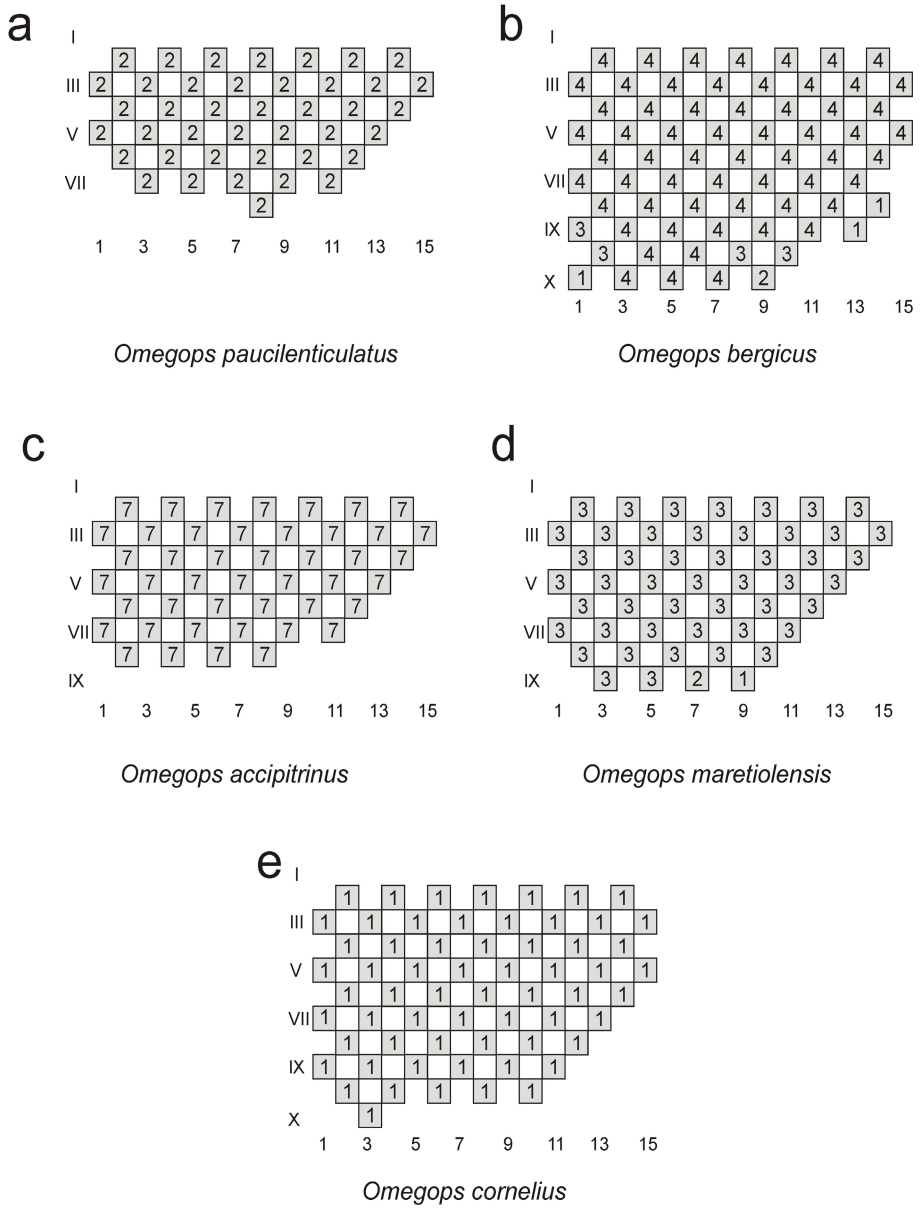

Figure 4. Schematic representation of (**a**) two visual surfaces in *Omegops paucilenticulatus* sp. nov., (**b**) four visual surfaces in *Omegops bergicus* (Drevermann, 1902), (**c**) seven visual surfaces in *Omegops accipitrinus* (Phillips, 1841), three visual surface in *Omegops maretiolensis* (Richter & Richter, 1933), and (**e**) one visual surface in *Omegops cornelius*, following the method of Thomas (1998). Front of visual surface is left; numbers below drawing denominate individual dorso-ventral files, counting from the front (1–15); roman numerals denote successive horizontal rows; numbers in boxes indicate a surface having that lens present in all visual surfaces.

is moderately inflated. Subocular librigenal field distinct as the appearance of an expanded furrow, fading towards the front of the eye. Posterolateral border furrow distinct, and the posterolateral border widens slightly at the genal angle. Postocular genal field swollen, with coarse and contiguous tubercles forming a postocular pad. **Frontal view:** Glabellar outline semicircular, becoming oblique laterally (divergence of 38°). Palpebral area lower than the inflated palpebral lobe. **Ventral view:** unavailable. **Sculpture:** Cephalon covered with coarse pustular tubercles lacking granules, with coarsest elements larger in diameter than lenses in eye, dense across the entire composite lobe. No tubercles on the occipital ring and few tubercles on the preoccipital ring. Dominant pits and smoothed-out tubercles on the lateral border. Aligned tubercles on the palpebral lobe. Short scaly ridges and pits laterally on the visible ventral portion of the anterior border.

Discussion. The studied cephalon is relatively well preserved and complete. Its main dimensions are consistent with those of other *Omegops* species (Fig. 5). The morphological features observed and discussed in the description support the erection of a new species and its assignment to the genus *Omegops*. They also allow comparisons with contemporaneous *Omegops* species from western Europe.

Omegops paucilenticulatus sp. nov. shares with *O. bergicus* a visual surface with 15 dorso-ventral files, intervening pits with subdued tubercles on the lateral border, and a postocular pad covered with several tubercles. However, *O. paucilenticulatus* sp. nov. differs by having a maximum of three lenses per vertical file (four in only one file; typically five in *O. bergicus*; see Fig. 4b). Morevover, the eye of *O. paucilenticulatus* is closer to the lateral margin than that of *O. bergicus*. In *O. paucilenticulatus*, the lateral border is moderately inflated and well isolated abaxially from the subocular area, whereas in *O. bergicus*, the lateral border is weakly inflated anteriorly and poorly separated abaxially from the wide (tr.) subocular area. Additionally, the postocular pad and the adjacent portions of the posterolateral border differ in their proportions. In *O. bergicus*, the border near the genal angle is much broader relative to the postocular pad than in *O. paucilenticulatus*, in which the posterolateral borders are relatively narrow.

Omegops paucilenticulatus sp. nov. shares with the type species *O. accipitrinus* a visual surface with 15 dorso-ventral files,

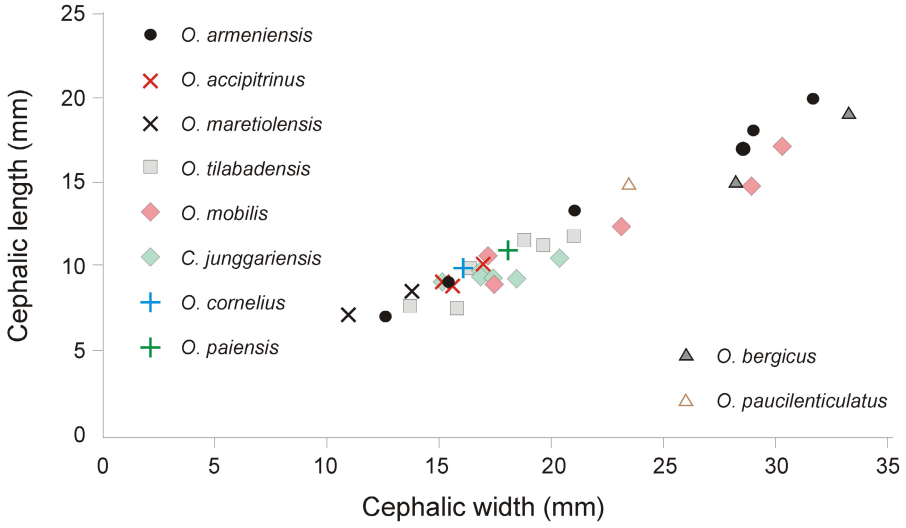

Figure 5. Cephalic ratios of nine *Omegops* species and one *Clarksonops* species. Sizes are based on specimens either illustrated or reported in the literature: *O. accipitrinus* and *O. maretiolensis* from Crônier et al. (2025), *O. tilabadensis* from Ghobadi Pour et al. (2018), *O. mobilis* and *Clarksonops junggariensis* from Zong (2023), *O. cornelius* from Weber (2000, p. 543), *O. paiensis* from Farsan (1998, p. 25), *O. armeniensis* from Crônier et al. (2026), *O. bergicus* and *O. paucilenticulatus* sp. nov. from this work.

elongated (tr.) lateral preoccipital lobes, a smooth subocular area forming an expanded furrow that fades anteriorly, intervening pits that dominate in appearance on the lateral border (with subdued tubercles in *O. paucilenticulatus* sp. nov.), and the absence of tubercles on the occipital ring. However, *O. paucilenticulatus* sp. nov. differs in having a maximum of three (rarely four) lenses per vertical file (typically four in *O. accipitrinus*; see Fig. 4c), a visual surface that is depressed anteriorly, and a postocular pad bearing several tubercles (rather than being smooth or bearing only a few tubercles as in *O. accipitrinus*).

Omegops paucilenticulatus sp. nov. resembles *O. maretiolensis* in having a visual surface with 15 dorso-ventral files, a rather smooth subocular area forming an expanded furrow that fades anteriorly, a postocular pad covered with several coarse tubercles, and elongated (tr.) lateral preoccipital lobes. *Omegops paucilenticulatus* sp. nov. differs from *O. maretiolensis* by having a maximum of three lenses (four in only one file) per vertical file (typically four in *O. maretiolensis*; see Fig. 4d), its lowered visual surface (Fig. 3b), the presence of intervening pits that dominate in appearance on the lateral border with subdued tubercles (a row of coarse tubercles in *O. maretiolensis*), and the absence of tubercles on the occipital ring (coarse tubercles in O. *maretiolensis*).

Omegops paucilenticulatus sp. nov. differs from *O. cornelius* from Germany by having a maximum of three lenses per vertical file (five in *O. cornelius*; see Fig. 4e), its lowered visual surface, and a rather smooth subocular area forming an expanded furrow that fades anteriorly (the subocular area being inflated and tuberculated in *O. cornelius*).

Other contemporary French *Omegops* species have been described. In southern France, Flajs & Feist (1988) described and illustrated a fragmentary cephalon from the uppermost Famennian at the La Serre locality in the Montagne Noire. This specimen exhibits a wide subocular area, similar to that of *O. accipitrinus*, and does not show a swollen postocular area. The absence of preserved occipital regions prevented the authors from assigning it to a specific taxon. Subsequently, Feist et al. (2021, fig. 4a–c) illustrated two fragmented cephala and one pygidium assigned to *O. accipitrinus* from the topmost *Wocklumeria* Limestones of the stratotype section LS-E' at La Serre. One of the two cephala figured in lateral view seems to exhibit a postocular pad covered with numerous coarse tubercles abaxially (unlike in *O. accipitrinus* from Belgium, which has few) and a wide subocular area with few tubercles.

Occurrence. Famennian (do VI), northern France.

5. Discussion and conclusion

The detailed examination of *Omegops* specimens from the Avesnois area, including those initially described by Dehée (1929) and the newly collected specimen from the disused Parcq Quarry, improves our understanding of the taxonomic relationships among latest Famennian *Omegops* species. The revision confirms the validity of *O. bergicus* as a distinct species, in agreement with Struve (1976), contrary to previous reassignments to *O. accipitrinus* or *O. maretiolensis*. Diagnostic features such as a wide cephalon, a less protruding glabella, a tuberculated postocular pad, and a rather long pygidium with a long pygidial axis are consistent with the type specimens from Ratingen (Germany) and distinguish *O. bergicus* from contemporary Belgian species recently discussed by Crônier et al. (2025).

The comparison of *Omegops paucilenticulatus* sp. nov. with other contemporaneous species highlights both similarities and subtle differences. The limited number of lenses per dorso-ventral file (three versus four or five in other species) is a key character to distinguish *O. paucilenticulatus* sp. nov. This new species illustrates local morphological diversification of *Omegops* in the Dinant Synclinorium and emphasizes that detailed characters, such as eye morphology and cephalic features, are essential for species-level distinction in late phacopids, just before the Hangenberg Crisis, which marked the final disappearance of the long-ranging order Phacopida. These features represent key characters in Devonian phacopid systematics. Such characters were central to Eldredge's detailed systematic analyses of Devonian phacopid trilobites (Eldredge, 1971), which later contributed an important empirical basis for the concept of punctuated equilibrium proposed by Eldredge & Gould (1972).

This study also underscores the value of re-examining historical collections. Early descriptions, such as those of Dehée (1929), were sometimes based on poorly illustrated material. Systematic re-illustration and analysis prevent taxonomic confusion and enhance understanding of both intraspecific and

regional morphological variation. Furthermore, the geographical distribution of the studied species suggests local differences between the Avesnois and the Belgian part of the Dinant Synclinorium, likely reflecting environmental variability or microhabitat differentiation in shallow-water settings during the latest Famennian. It is worth noting that many Belgian sections have yielded Strunian phacopids (e.g. Conil et al., 1986), but only a small fraction of this material has been properly documented.

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Author contribution

CC described the illustrated fossil material. Authors participated to the writing of the paper.

Data availability

All studied specimens are housed in official repositories guaranteeing their long-term safekeeping and availability to other researchers for future studies.

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