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A new *Trimerocephalus* species (Trilobita, Phacopidae) from the Late Devonian (Early Famennian) of Poland

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Abstract

This study presents a detailed morphological analysis of a new species belonging to the blind trilobite *Trimerocephalus* McCoy, 1849, *T. chopini* n. sp., based on exceptionally well preserved articulated specimens from the Late Devonian (Early Famennian) of the Holy Cross Mountains in central Poland. The occurrence of this taxon in Kowala Quarry near Kielce has been reported previously, with specimens often found in single-file queues representing migratory behaviour that was followed by a mass mortality event that preserved these assemblages. The new taxon is compared with other species of *Trimerocephalus* and is interpreted as being most closely related to a clade consisting of *T. caecus*, *T. lelievrei*, *T. mimbi*, *T. shotoriensis* and *T. tardispinosus*.

Key words: Phacopinae, Late Devonian, Famennian, Holy Cross Mountains, Poland

Introduction

The blind phacopine genus *Trimerocephalus* McCoy, 1849 appears to have almost worldwide distribution in Late Devonian (Famennian) strata, except for America. Seventeen species of this genus are known (Crônier, 2003; Feist *et al.*, 2009), six of which occur in Poland: *T. caecus* (Gürich, 1896), *T. dianopsoides* Osmólska, 1963, *T. interruptus* Berkowski, 1991, *T. mastophthalmus* (Richter, 1856), *T. polonicus* Osmólska, 1958, and *T. (Trifoliops) trifolius* (Osmólska, 1958). These species are widely distributed in the Famennian carbonate strata of the Holy Cross Mountains (Osmólska, 1958, 1963; Radwański *et al.*, 2009), while a single species is also found at Dzikowiec (formerly Ebersdorf) in Silesia (Lewowicki, 1959).

Numerous specimens of *Trimerocephalus* were recently collected from yellowish marly shales of Early Famennian age that are exposed in the western part of the northern wall in Kowala Quarry (near Kielce in the Holy Cross Mountains, south-central Poland; Fig. 1). This occurrence was previously reported by Kin and Radwański (2008) and Radwański *et al.* (2009), but without detailed taxonomic and morphological analysis. The total thickness of the Famennian succession exposed in this quarry, which consists of five units (i.e., H–L = *Palmatolepis triangularis* to *Palmatolepis expansa* conodont zones), is approximately 180 m (see Berkowski, 2002). Age-diagnostic conodonts from the marly sediments—that also contain both monospecific trilobite queues and rare single specimens—are indicative of the lower part of the *Palmatolepis marginifera* Zone (see Radwański *et al.*, 2009, p. 460; Unit I of Berkowski, 2002).

The vast majority of *Trimerocephalus* specimens forming queues are partially or fully articulated and show considerable size variation (i.e., 5–20 mm in length). These trilobites are positioned on the tops of bedding surfaces, forming a single queue composed of a few to several specimens. The queue length is limited simply by the size of the joint-cracked stratum surface. The occurrence of the queues is restricted to two main horizons of marly shales, and a few queues were also found on the surface of some calcareous concretions, which occur irregularly within those horizons (Radwański *et al.*, 2009). Successive horizons also contain isolated juvenile (Fig.