

# A New Species of *Adelophthalmus* (Eurypterida) from the Lower Carboniferous of the Krasnoyarsk Region

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**Abstract**—A new species of *Adelophthalmus*, a genus recorded infrequently in the former Soviet Union, is described from the Tournaisian of the Krasnoyarsk Region.

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**Key words:** Eurypterida, *Adelophthalmus*, new species, Carboniferous, Russia, Krasnoyarsk Region.

## INTRODUCTION

In 1990, the specimens collected by the Krasnoyarsk Geological Expedition near the village of Sakhapta (Nazarovskii District, Krasnoyarsk Region) in the Solomennyi Stan Formation (Tournaisian Stage, Carboniferous) were sent to the Paleontological Institute of the Russian Academy of Sciences (PIN). These are compression fossils of eurypterids assigned to the genus *Adelophthalmus* (on account of the shape of the prosoma, the position of the compound eyes, and scale-like ornamentation) and are described as a new species below. The find is interesting owing to the rarity of this genus and of Carboniferous eurypterids in general in the former Soviet Union; only *Adelophthalmus carbonarius* Chernyshev and *Unionopterus anastasiae* Chernyshev have been described from the Carboniferous of the Soviet Union (Chernyshev, 1933, 1948).

## SYSTEMATIC PALAEOLOGY

Family *Adelophthalmidae* Tollerton, 1989

Genus *Adelophthalmus* Jordan et Meyer, 1854

*Adelophthalmus irinae* Shpinev, sp. nov.

**Etymology.** The species is named in honor of Irina Peskova.

**Holotype.** PIN, no. 5109/4, reasonably preserved prosoma (negative impression); near the village of Sakhapta, Nazarovskii District, Krasnoyarsk Region; Solomennyi Stan Formation, Tournaisian, Lower Carboniferous.

**Description** (Figs. 1, 2). Medium-sized eurypterid. The prosoma is semielliptical, with a narrow marginal rim, its length to basal width ratio is 0.65 to 0.80 (0.74 in the holotype). The compound eyes are elliptical to weakly reniform, positioned in the anterior half of the prosoma (their posterior margins are close to the

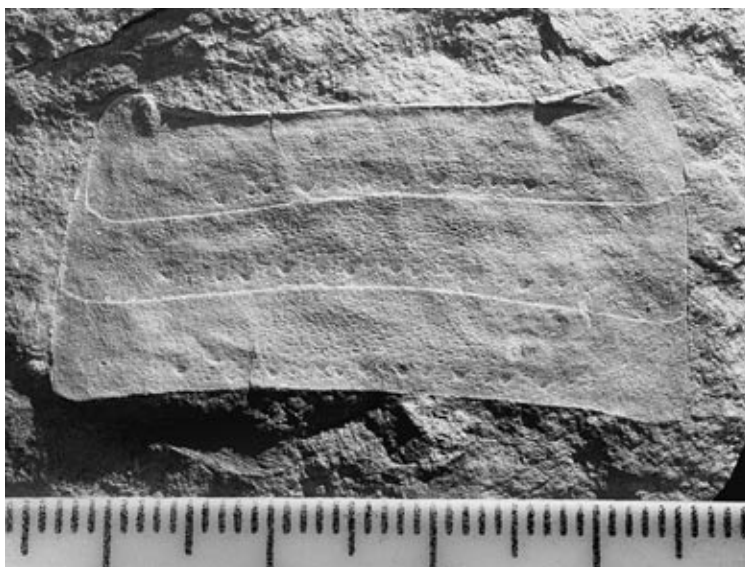
midlength of the prosoma). The distance from the eye to the lateral margin of the prosoma is somewhat larger than the eye length. The distance between the anterior ends of the eyes is approximately three times, and between the posterior ends of the eyes is approximately four times as long as the eye length. The median ocelli are small, located in the center of the prosoma, nearly level with the posterior margin of the compound eyes.

The appendages are unknown. The epistoma, metastoma, and other structures of the ventral side are unknown. The opisthosoma is only fragmentarily preserved. The first mesosomal tergite (in PIN, no. 5109/5) is apparently much shorter than the others: its length-to-width ratio is no more than 0.09, whereas that of other tergites is 0.15–0.16. The telson is unknown.

The peculiar ornamentation of integument is characteristic of all sufficiently well preserved specimens of this species. The prosoma is covered with small semilunar scales (size ca. 0.1 mm). The convex side of scales is oriented caudad in the scales located anterior to the eyes, between the eyes, and in the posteromedial prosomal zone (sometimes slightly mediad above the eyes); caudomedial in the scales posterior and lateral to the eyes; and caudolaterad near the posterior prosomal angles. Along the posterior prosomal margin, a row of larger (up to 1 mm) triangular scales are developed in some specimens (including the holotype). The opisthosomal tergites are also covered with semilunar scales (size 0.1–0.5 mm), which are usually smaller in the anterior zone of the tergite than in its middle and posterior zone; this anterior zone of the tergite is sometimes separated by a more or less developed line of subcontiguous scales; along the posterior margin of the tergite, there is a row of contiguous or separate, larger (up to 1 mm), triangular scales.



**Fig. 1.** *Adelophthalmus irinae* sp. nov.; holotype PIN, no. 5109/4: prosoma; scale-division value, 1 mm.



**Fig. 2.** *Adelophthalmus irinae* sp. nov.; paratype PIN, no. 5109/8: fragment of opisthosoma; scale-division value, 1 mm.

**M e a s u r e m e n t s, mm:** Prosoma: (L) length, (W) basal width, (R) L/W ratio, (Wbe) width posterior to the eyes, (Le) length of the eye, (We) width of the eye, (Lae) distance between the anterior ends of eyes, and (Lpe) distance between the posterior ends of eyes.

Specimen PIN, no.	L	W	R	Wbe	Le	We	Lae	Lpe
5109/1	10.7	16.3	0.66	14	2–2.2	1.2–1.4	ca. 6.5	ca. 8.5
5109/3	8.4	10.5	0.80	9.5	1.7	ca. 1	ca. 4	ca. 5.5
5109/4 (holotype)	18	24.2	0.74	22	3	2.5	ca. 9.5	ca. 11
5109/5	10.7	15.8	0.68	–	1.4	1	–	–

Opisthosoma: fragment representing three joined tergites (specimen PIN, no. 5109/8; numeration of tergites is conventional, their true numbers within the opisthosoma are unknown): (Lm) medial length, estimated for tergites 2 and 3 overlapped by preceding tergite; (Wp) basal width; and (R) Lm/Wp ratio.

Tergite no.	Lm	Wp	R
1	5.8	39.3	0.15
2	ca. 6	40	ca. 0.15
3	ca. 6.5	41	ca. 0.16

A fragment of the opisthosoma of specimen PIN, no. 5109/11 has the same ornamentation of tergites, but is much smaller in size, incomplete, and distorted (no exact measurement are possible): the tergite length is not more than 2.5 mm, and the tergite width is hardly more than 15 mm.

**Comparison.** The new species is distinct from congeners in the nearly elliptical shape of the compound eyes, the absence of spines on the epimera, and in the orientation of sculpture elements on the prosoma. In addition, it differs from *A. mazonensis* (Meek et Worthen, 1868) (Clarke, Ruedemann, 1912) in the absence of posteromedial prominences on the opisthosomal tergites; there are not enough specimens of the new species to obtain reliable biometric data, but comparing their size to the size range given for *A. mazonensis* (Kjellesvig-Waering, 1963), it is possible to conclude that the new species is smaller, with a narrower prosoma. *A. irinae* differs from *A. mansfieldi* (Hall, 1877) (Clarke, Ruedemann, 1912) in the absence of posteromedial prominences on the opisthosomal terg-

ites and less angular elements of ornamentation; it differs from *A. imhofi* (Reuss, 1855) (Laveine, 1973) in the more semicircular and apparently wider prosoma, and probably in the smaller size, and from *A. carbonarius* Chernyshev, 1933 (Chernyshev, 1933) in the more basal position of compound eyes.

**Material.** In addition to the holotype, paratypes PIN, nos. 5109/1, 2, 3, 5, 8, 11, 13 and several other apparently conspecific specimens, PIN, nos. 5109/6, 7, 9, 10, 12.

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