

## First occurrence of *Eryma bedelta* (QUENSTEDT) (Crustacea, Decapoda) from the Aalenian of Iran

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With 3 text-figures

### Abstract

A single specimen of a macrurous decapod is described for the first time from the Aalenian of northern Iran (Central Alborz). It is referred to *E. bedelta* (QUENSTEDT), a long ranging ancestral species with a wide distribution in the Middle Jurassic of northwestern Europe.

### Kurzfassung

Aus dem unteren Dogger des Imamzadeh Hashim Passes (Zentralalborz) wird zum ersten Mal der Rest eines Langschwanzkrebsses beschrieben. Er wird *Eryma bedelta* (QUENSTEDT) zugeordnet, einem im Dogger NW-Europas langlebigen und weitverbreiteten primitiven Vertreter der Gattung *Eryma*.

### Biostratigraphy and age

In North and Central Iran the Lower and a varying part of the Middle Jurassic consists of clastic, partly terrestrial and carbonaceous sediments, known as Shemshak Formation (ASSERETO 1966; NABAVI & SEYED-EMAMI 1977). This detritic sequence with thicknesses varying from a few meters to more than 3000 m shows conspicuous marine transgressions in Early Sinemurian, Domerian and Toarcian/Aalenian times (SEYED-EMAMI, 1967, 1971; ASSERETO et al. 1968). The specimen described here has been obtained from the Shemshak Formation north of the Imamzadeh Hashim Pass on the main road to Amol (ca. 80 km northeast of Tehran). At this locality the Shemshak Formation attains a thickness of more than 2000 m and rests discontinuously (beginning with few meters of refractory clays) upon an eroded and karsty surface of Lower Triassic limestones (Calcaires Vermiculés of the Elikah Formation). A threefold division of the Shemshak Formation as proposed by NABAVI & SEYED-EMAMI (1977) can be observed. The lower part consists of a sequence of dark, grey-olive shales, siltstones and greywackes with a few thin-bedded calcareous beds containing marine fauna (pelecypods and belemnites); there are also some smaller coal-seams. The middle part consists mainly of green quartzose sandstones and shale intercalations with some pelecypods and ammonites (*Amaltheus*, *Arieticerat*, *Dactylioceras*). The

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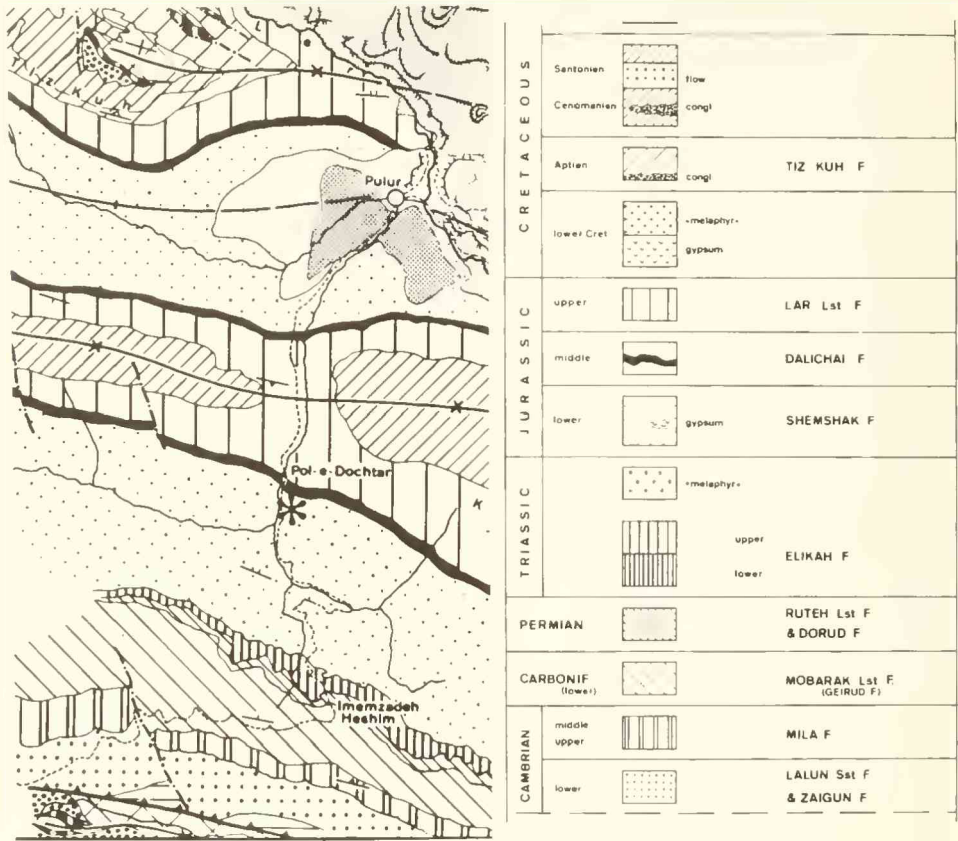


Fig. 1: Geological map of the Imamzadeh Hashim area (after ALLENBACH 1966) and site from which *Eryma bedelta* has been collected.

upper part begins with a sequence of micaceous shales and calcareous sandstones containing a rich marine fauna of Toarcian/Aalenian age (*Pseudogrammoceras fallaciosum* (BAYLE), *Leioceras opalinum* (REINECKE), *Ludwigia murchisonae* (SOWERBY) etc). In the higher parts it gives way to greyish-blue, sterile marls which are continuously overlain by the limestones and marls of the following Dalichai Formation (Mid.-Upper Dogger).

### Systematic description

Order Decapoda LATREILLE 1803  
 Infraorder Astacidea LATREILLE 1803  
 Family Erymidae v. STRAELEN 1924  
 Genus *Eryma* v. MEYER 1840

*Eryma bedelta* (QUENSTEDT 1857)

Synonymy: see FÖRSTER 1966: 95

Horizon and locality: Shemshak Formation, upper part with *Leioceras opalinum* (REI-

NECKE), *L. costosum* (QUENSTEDT) and *L. comptum* (REINECKE) of the *opalinum* Zone; about 800 m southeast of the bridge Pol-e-Doch-tar.

**Diagnosis:** Postcervical groove deeper than branchiocardiac groove; grooves nearly parallel and no joining at their ventral ends. Short, but distinct gastrical groove. Tubercle w distinct. Surface granulate to punctate.

Measurements: (in mm)

L	H	G	Ca	Cp	B	Hd	Hb	bb
37,1	22,5	17,0	7,8	3,8	8,5	8,2	16,0	5,8
L/H	H/Hd	H/Hb	L/G	C/B	Ca/Cp	C/bb		
1.6	2.7	1.4	2.2	2.4	2.1	2.0		

Abbreviations for measurements (for illustration see FÖRSTER 1966, fig. 1) *L* length of carapace; *H* height of carapace; *G* length of gastric region (measured from base of rostrum to cervical groove along dorsal midline); *Ca* length of anterior part of cardiac region (= distance cervical to postcervical groove along dorsal midline); *Cp* length of posterior part of cardiac region; *B* length of branchial region (measured from dorsal trace of branchiocardiac groove to posterior edge of carapace; *Hd* height of gastric region (measured from gastric groove to projection of dorsal midline); *Hb* height of cardiac region (measured from junction of branchiocardiac and hepatic grooves to projection of dorsal midline); *bb* distance between cervical and junction of branchiocardiac and hepatic grooves.

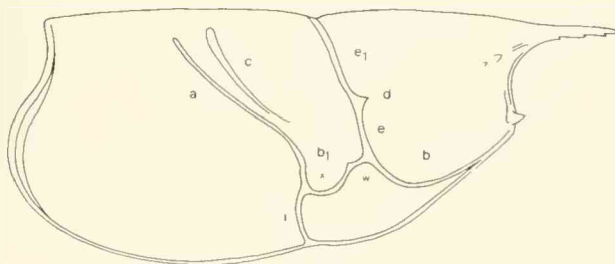


Fig. 2: *Eryma bedelta* (QUENSTEDT); Terminology of carapace grooves. *ee*<sub>1</sub> cervical groove; *d* gastroorbital groove; *b* antennal groove; *b*<sub>1</sub> hepatic groove; *c* postcervical groove; *a* branchiocardiac groove; *x* attachment area of the adductor testis muscle; *w* external articulation of the mandible.

**Remarks:** FÖRSTER recently (1966:95) summarized all informations on known representatives of the species *E. bedelta* (QUENSTEDT), showing up that different preservation styles (specimens with shell; steinkerns of decalcified and compressed molts; in shales, limestones or sandstones) and the use of regional different names from the last century (*E. greppini*, *E. elegans*, *E. girodi*, *E. bizet* e. g.) concealed the real stratigraphic and geographic range of this ancestral type, from which the bulk of the Late Jurassic erymids can be derived by a rapid radiation in mid-Jurassic times. The new Iranian specimen excellently coincides in all measured parameters and in its ornamentation with carapaces of *E. bedelta* from Europe. The greater height depends on the higher degree of lateral compression for this single right half of a dorsally splitted carapace.

In Europe this ancestral form ranges from the Late Toarcian (with first occurrences in eastern France and eastern England) to the Early Callovian (Cornbrash) of eastern England, with a maximum during the Bajocian-Bathonian in northwestern Europe (E-England, N- & E-France, W-Switzerland, N- & S-Germany).



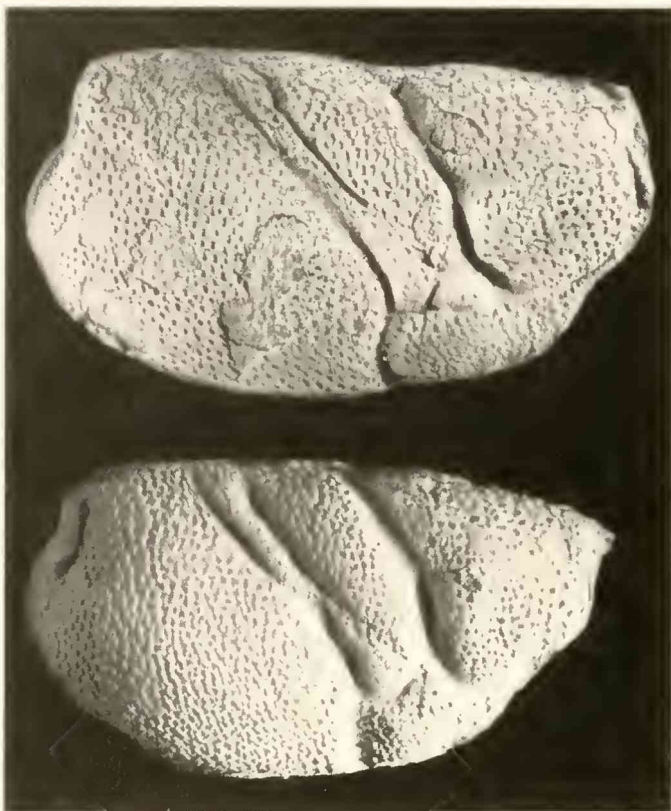


Fig. 3: (above): *Eryma bedelta* (QUENSTEDT) from the Shemshak Formation (*opalinus*-zone), Imamzadeh Hashim Pass northeast of Tehran, Iran;  $\times 1$ ; (München Inv. Nr. 1979 I 129) – (below): *Eryma bedelta* (QUENSTEDT) from the upper Bathonian, Eimen, near Einbeck, northern Germany (fig. FÖRSTER 1966, pl. 14, fig. 6);  $\times 1$ ; (Geol. Komm. Berlin Nr. x 262).

Prior to this study there was no reference for an occurrence of *E. bedelta* in the tethyan realm, from which in general only few representatives of the genus *Eryma* have been described: A right half of a carapace from the Early Aalenian of Jefbi (Moluccas, Indonesia), *Eryma boehmi* v. STRAËLEN (1931: 158, figured by SOERGEL 1913: 622, pl. 24, fig. 9) differs in the unusual dorsal lengthening of the cardiac region and the extremely shortening of the branchial region. A left half of a carapace and a (?) right chela from the Late Bathonian of northern Tanzania, described by HENNIG (1924: 47, pl. 2, fig. 11, pl. 3, fig. 11) as *E. calloviensis* shows with the joining of postcervical and branchiocardiac grooves closer relationships to *E. ornata* (QUENSTEDT). Two carapace fragments from Tanzania, primarily referred to *E. bedelta* (BEUREN 1933: 89, fig. 1) and later to *E. fossata* KRAUSE (HENNIG 1937: 185) originate from the much younger Mandawa Series (Septarienmergel, Kimmeridgian) and can probably be placed in *E. madagascariensis* SECRETAN.

The occurrence of this benthonic decapod associated with other elements of the northwestern European realm supports closer marine connections between these two areas during Toarcian – Early Bajocian times.

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