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.

**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 karstic 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 (*Amaltbeus, Arieticeras, Dactylioceras*). The
upper part begins with a sequence of micaceous shales and calcareous sandstones containing a rich marine fauna of Toarcian/Aalenian age (*Pseuogrannoceras 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 Erymididae 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. comatum* (Reinecke) of the opalinum Zone; about 800 m southeast of the bridge Pol-e-Dochtar.

Diagnosis: Postcervical groove deeper than branchiocardiace 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)

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<td>8.2</td>
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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 FORSTER 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 branchiocardiace groove to posterior edge of carapace; Hd hight of gastric region (measured from gastric groove to projection of dorsal midline); Hb height of cardiac region (measured from junction of branchiocardiace and hepatic grooves to projection of dorsal midline); bb distance between cervical and junction of branchiocardiace and hepatic grooves.

Fig. 2: *Eryma bedelta* (Quenstedt); Terminology of carapace grooves. ee, cervical groove; d gastroorbital groove; a antennal groove; h1 hepatic groove; c postcervical groove; a branchiocardiace groove; x attachment area of the adductor testis muscle; w external articulation of the mandible.

Remarks: FORSTER 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).
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. Straelen (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* (Beurlen 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 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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References