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To cite this article: Marief Ferrari, Magdy El-Hedeny, Mohamed Zakhera, Ahmed El-Sabbagh & Saleh Al Farraj (2018) Middle–Upper Jurassic marine gastropods from central Saudi Arabia, *Alcheringa: An Australasian Journal of Palaeontology*, 42:3, 383–401, DOI: [10.1080/03115518.2018.1465996](https://doi.org/10.1080/03115518.2018.1465996)

To link to this article: <https://doi.org/10.1080/03115518.2018.1465996>



Published online: 13 May 2018.



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# Middle–Upper Jurassic marine gastropods from central Saudi Arabia

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Ferrari, M., El-Hedeny, M., Zakhera, M., El-Sabbagh, A. & Al Farraj, S., May 2018. Middle–Upper Jurassic marine gastropods from central Saudi Arabia. *Alcheringa*.

A total of 68 gastropod specimens are reported from the Middle–Upper Jurassic sedimentary successions exposed at central Saudi Arabia. The studied material comes from the Tuwaiq Mountain and Hanifa formations at the Khashm al Qaddiyah, Dirab, Jabal al Abakkayn and Maáshabah sections. Thirteen species are identified, described and illustrated. Among them, a new *Aporrhais* species (*A. sauditica* sp. nov.) is introduced. In addition, two further possible new *Pseudomelania* species from the same strata are mentioned. Other members of the assemblage include *Kosmophalus*? sp. aff. *K. reticulatus* Fischer, *Bourguetia*? sp. aff. *B. saemanni* (Oppel), *Bourguetia*? sp., *Ampullospira* sp., *Globularia*? sp. cf. *G. bajociana* Fischer, *Purpuroidea* sp. aff. *P. glabra* Morris and Lycett, *Purpuroidea* sp., *Cossmannea* sp. aff. *C. desvoidyi* (d’Orbigny), *Cryptoplocus* sp. aff. *C. depressus* (Voltz) and *Actaeonina*? sp. Stratigraphically, seven species of this gastropod assemblage were only reported from the Middle Jurassic, whereas the other six ones are extending from the Middle to the Upper Jurassic of the studied succession. As compared with their gastropod content, the Khashm al Qaddiyah represents the richest section (33 out of 68 specimens, 48.5%), whereas the Maáshabah section showed an impoverished gastropod assemblage (only three specimens, 4.4%). The species reported here show paleobiogeographical affinities with coeval gastropod assemblages from India, east Africa, Middle East (Israel, the Sinai of Egypt) and western Tethys. The identified species confirm three depositional settings: open shelf lagoon, shoal/fore-shoal and open marine environments. The lower degree of fragmentation, poor sorting and scarcity of abrasion indicate a parautochthonous faunal assemblage.

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Key words: gastropods, Middle–Upper Jurassic, systematics, paleoecology, paleoenvironment, central Saudi Arabia.

IN CENTRAL Saudi Arabia, marine Middle–Upper Jurassic sedimentary successions are well exposed and were deposited extensively over the Central Arabian Arch. They have been deposited upon a broad, shallowly submerged rimmed marine shelf, with localized deeper intrashelf basins (Le Strat *et al.* 1985, Le Nindre *et al.* 1990a, Hughes 2004a, 2004b, 2008, El-Asmar *et al.* 2015, El-Sorogy *et al.* 2016, El-Sabbagh *et al.* 2017).

These successions contain diverse benthic macrofaunal assemblages. Several works have been published on the macropaleontology of these Jurassic deposits, including ammonites (Enay *et al.* 1987, Enay & Mangold 1994), nautiloids (Tintant 1987), bivalves (Hewaidy *et al.* 2016, Zakhera *et al.* 2017), brachiopods (Almérás 1987, Cooper 1989) and corals (El-Asa’ad 1989, 1991, El-Sorogy *et al.* 2014, El-Sorogy & Al-Kahtany 2015). In contrast, gastropods are poorly studied, and rare published works have recently studied

them systematically (Fischer *et al.* 2001, Hewaidy *et al.* 2016).

Along with bivalves, gastropods represent the common element of the Jurassic strata in Saudi Arabia (e.g., Fischer *et al.* 2001, El-Sabbagh *et al.* 2017). During our recent field surveys in central Saudi Arabia, concentrating mostly on Callovian–Oxfordian rocks, detailed sampling of fossils provided a precise view of the *in situ* distribution of the gastropods. Comparison of the material with taxa previously described from this area showed that the known record is not complete. Therefore, this research aims at the systematic revision of a gastropod collection from the Callovian–Oxfordian succession of central Saudi Arabia and at the interpretation of its paleoecology and paleoenvironment.

## Material

During the period from 2013 to 2016, four Callovian–Oxfordian successions crop out around the capital Riyadh were investigated in detail (Fig. 1). The first

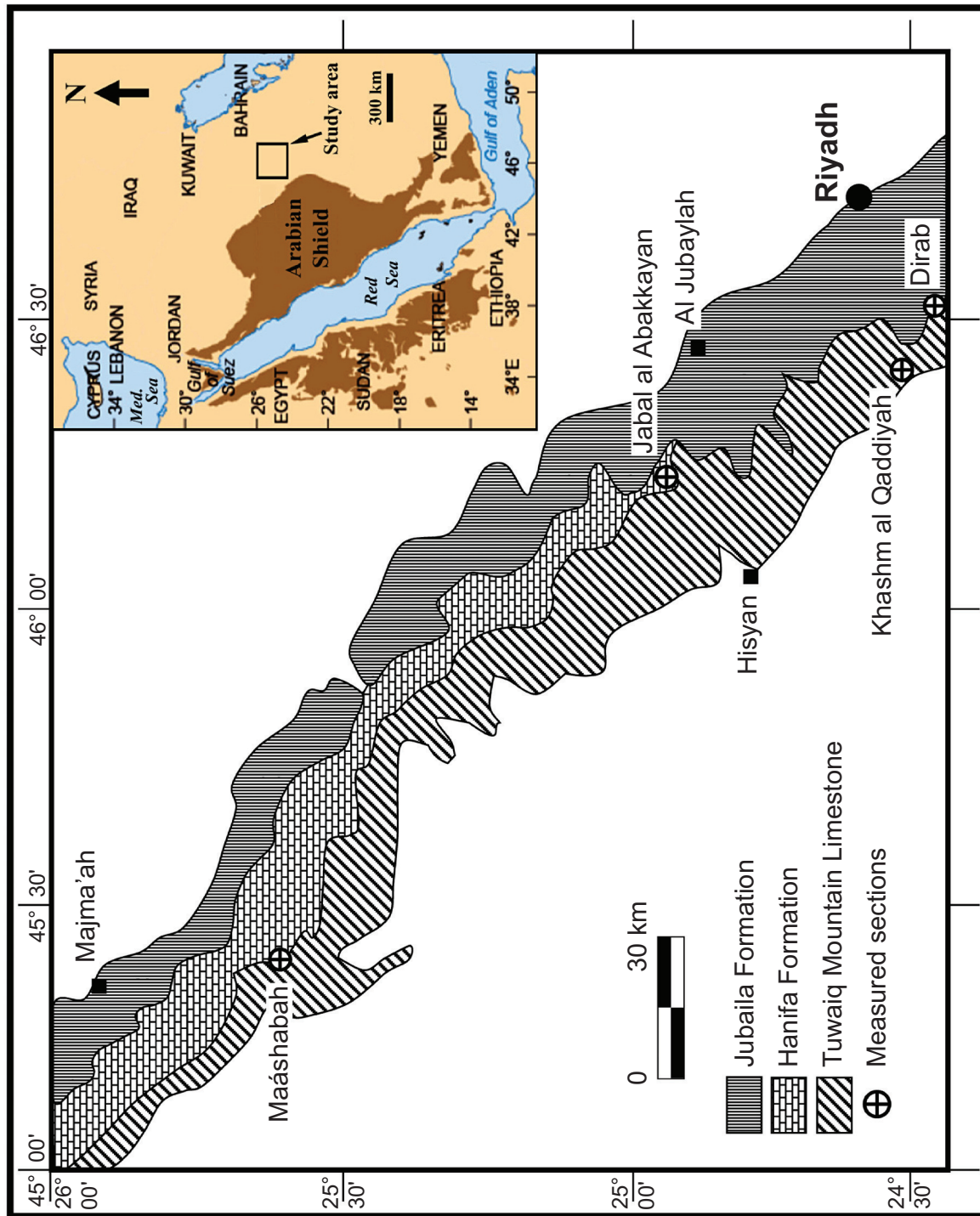


Fig. 1. Location map showing the location of the studied sections (modified after El-Hedeny *et al.* 2012).