

BRACHIOPODS FROM THE LOWER RED FORMATION (LOWER OLIGOCENE) OF THE ISFAHAN PROVINCE, CENTRAL IRAN

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Bitner, M. A., Bahrami, A., Yazdi, M. & Zágoršek, K., 2023. Brachiopods from the Lower Red Formation (Lower Oligocene) of the Isfahan Province, Central Iran. *Annales Societatis Geologorum Poloniae*, 93: 411–422.

Abstract: The study presents the first record of Early Oligocene brachiopods from the Lower Red Formation of the Isfahan Province, Central Iran. The assemblage comprises six brachiopod taxa, belonging to five genera, *Novocrania* Lee and Brunton, *Thecidellina* Thomson, *Argyrotheca* Dall, *Joania* Álvarez, Brunton and Long, and *Platidia* Costa. Two species are described as new, *Thecidellina persica* sp. nov. and *Argyrotheca ramshehensis* sp. nov. The discovery of *Thecidellina* in Iran is the first confirmed occurrence of this genus in Oligocene deposits, filling the gap between known Eocene and Miocene occurrences. At the species level, the brachiopods investigated here show no affinity to those from the Lower Miocene Qom Formation.

Key words: Brachiopoda, new species, Early Oligocene, Rupelian, Lower Red Formation, Ramsheh section, Iran.

Manuscript received 19 March 2023, accepted 7 August 2023

INTRODUCTION

In contrast to Europe, where Paleogene and Neogene brachiopods have been investigated intensively, those from Iran are still poorly known. Although the presence of brachiopods (without descriptions) was mentioned from several sections of the Qom Formation (Nouradini *et al.*, 2014, 2015, 2019; Zágoršek *et al.*, 2017) while investigating other fossils, the first record describing brachiopod taxonomy is that from the Lower Miocene deposits of the Qom Formation in the Esfahan-Sirjan Basin, where six species, i.e., *Lacazella mediterranea* (Risso, 1826), *Megathiris detruncata* (Gmelin, 1791), *Argyrotheca cuneata* (Risso, 1826), *A. bitnerae* Dulai *in* Dulai and Stachacz, 2011, *Joania cordata* (Risso, 1826), and *Platidia anomioides* (Scacchi and Philippi *in* Philippi, 1844), were recognized (Pedramara *et al.*, 2019). Recently, two new records of brachiopods from the Qom Formation have been reported (Bitner *et al.*, 2023).

The aim of the present paper is to describe newly collected brachiopod fauna from the Lower Oligocene deposits of the Lower Red Formation of the Isfahan area, Central Iran. Although represented only by six species, this is the

first record of brachiopods from the Lower Red Formation. The palaeontological and palaeogeographical significance of this fauna is also discussed.

GEOLOGICAL SETTING

The Lower Red Formation, cropping out in Central Iran, overlies unconformably the Eocene volcanic rocks and is overlain by the Qom Formation of Late Oligocene–Early Miocene age, usually with an angular unconformity that is difficult to identify (Morley *et al.*, 2009). The age of the Lower Red Formation is dated as Early Oligocene (Khaksar and Maghfouri-Moghadam, 2007; Mohammadi, 2021). After the Late Eocene collision of the Arabian and Eurasian plates the cessation of major arc volcanism is observed (Allen and Armstrong, 2008). During this time, Central Iran underwent broad subsidence, leading to the deposition of the Lower Red and Qom formations. The thickness of the Lower Red Formation is from 300 to 1,000 m. It is very variable in lithology, both laterally and vertically, being

composed of shales, siltstones, marls with gypsum, sandstones, conglomerates, and evaporites. Although in Central Iran the Lower Red Formation is characterized mostly by continental deposits, the occasional occurrence of marine fossils clearly indicates marine incursions into the basin (Khaksar and Maghfouri-Moghadam, 2007; Morley *et al.*, 2009).

The studied section is located at Ramsheh, approximately 135 km southeast of Isfahan (Fig. 1). The WGS coordinates of the base of the section are 31°30'33.85"N and 52°43'56.91"E, while those of the top are 32°30'42.41"N and 52°44'99.22"E. In the Ramsheh section, the deposits are red conglomerates, sandstones, red silts and marls, and red shales and sandy limestones in the upper part (Fig. 2). Apart from brachiopods they contain foraminifers, corals, ostracods, bryozoans, molluscs, and echinoderms.

MATERIAL AND METHODS

The brachiopods, described in this study, were collected during the fieldwork, carried out in September 2019 at the locality Ramsheh, Central Iran (Fig. 1). The specimens were obtained from the bulk sample (about 4–5 kg) of marly limestone, soaked in a solution of hydrogen peroxide, then washed and wet-sieved at mesh 0.5 mm. The material is poorly to moderately preserved. Most specimens are infilled with micrite matrix, rarely showing internal structures. The total number of examined specimens is 70.

Specimens selected for scanning electron microscopy were mounted on stubs, coated with platinum and photographed using a Philips XL-20 microscope at the Institute of Paleobiology, Warszawa. The material studied is housed at the Geology Museum of the University of Isfahan, Iran, under the number UIGM2001-2025.

SYSTEMATIC PALAEOONTOLOGY

Phylum Brachiopoda Duméril, 1805
 Subphylum Craniiformea Popov, Bassett,
 Holmer and Laurie, 1993
 Class Craniata Williams, Carlson, Brunton,
 Holmer and Popov, 1996
 Order Craniida Waagen, 1885
 Superfamily Cranioidea Menke, 1828
 Family Craniidae Menke, 1828
 Genus *Novocrania* Lee and Brunton, 2001

Type species: *Patella anomala* Müller, 1776, by original designation of Lee and Brunton (1986).

Novocrania sp.
 Fig. 3A–C

Material: One complete dorsal valve, and six damaged, fragmented dorsal valves.

Description: The only complete dorsal valve is the largest one, reaching 4.3 mm long and 4.5 mm wide. The valve is thin, its outline subcircular, posterior margin straight, low conical with apex situated subcentrally to subposteriorly. Surface smooth with weakly marked growth lines. Muscle scars weakly defined or invisible. Posterior adductor muscle scars large, circular, widely separated. Anterior muscle scars oval, slightly elevated. Support structure attachment scars not visible. Marginal rim narrow.

Remarks: This is the first record of *Novocrania* from the Cenozoic strata of Iran. The poorly preserved, mostly fragmented material and absence of the ventral valve that is taxonomically important (see Robinson, 2017a), prevent any species assignment. The thin shell distinguishes the Ramsheh specimens from the Paleogene and Neogene

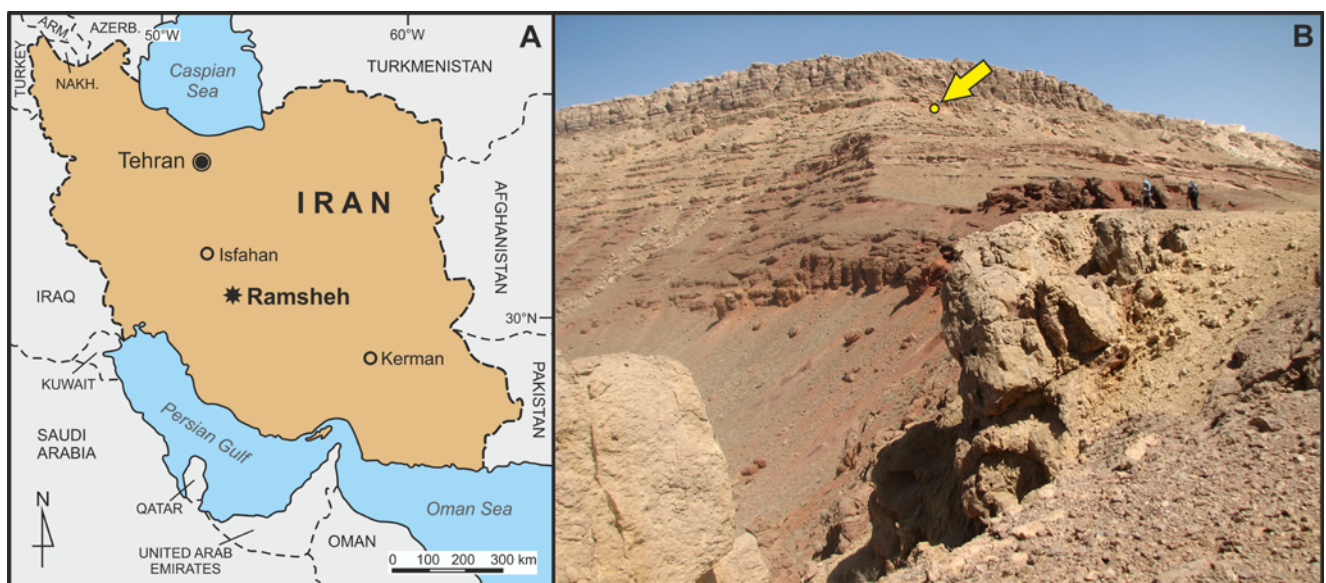


Fig. 1. Location of the sampled section. **A.** Sketch map of Iran, showing the locality of Ramsheh, at which the brachiopods were collected. **B.** Panoramic view of the Lower Red Formation in the Ramsheh section; collection site indicated by an arrow. ARM. – Armenia, AZERB. – Azerbaijan, NAKH. – Nakhchivan.

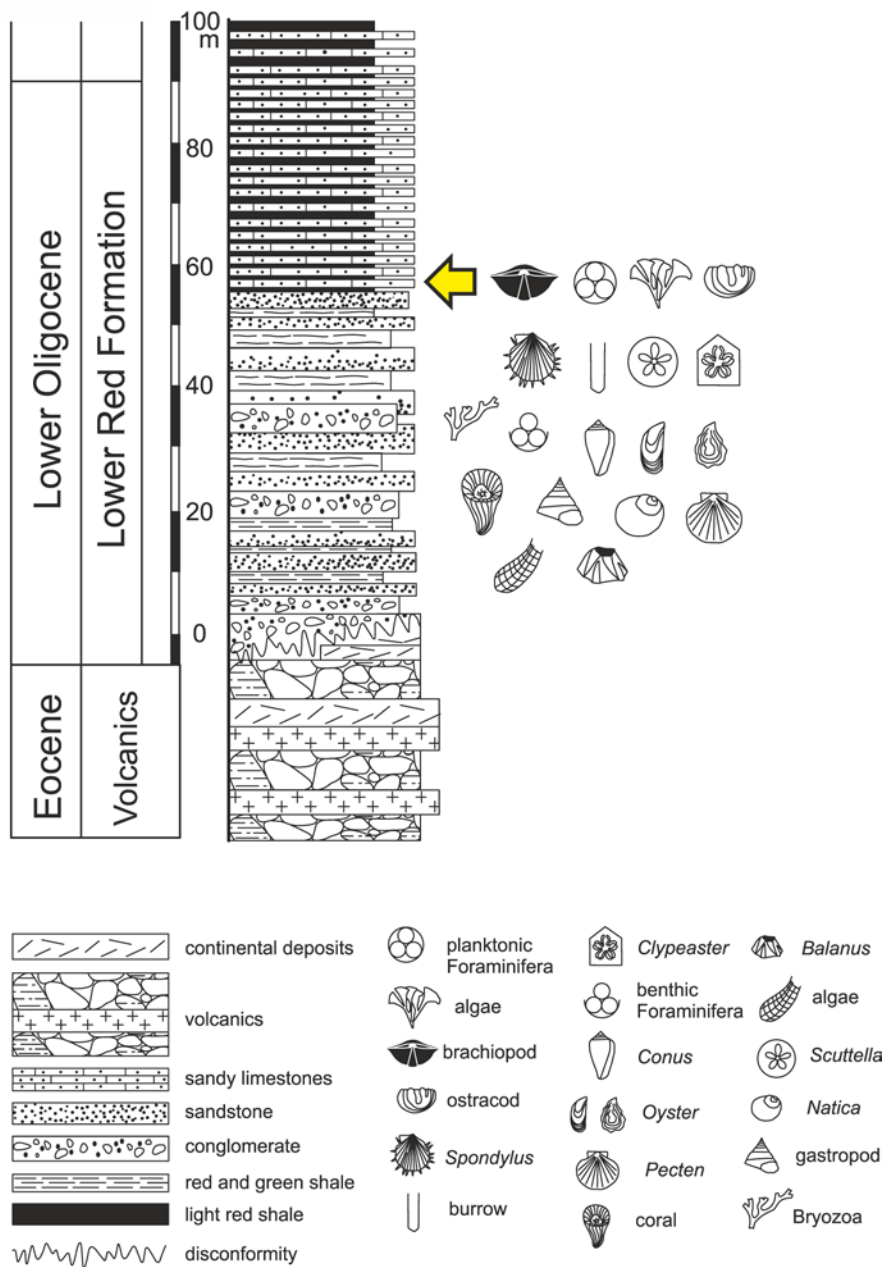


Fig. 2. Lithostratigraphic column of the Ramsheh section; sampling level indicated by an arrow.

craniids of Europe (see Bitner and Dulai, 2004, 2008; Kroh *et al.*, 2008; Bitner *et al.*, 2013; Bitner and Motchurova-Dekova, 2016; Bitner and Müller, 2017).

Occurrence: Lower Oligocene Lower Red Formation, Ramsheh section, Iran. The genus *Novocrania* has a stratigraphic range of Paleocene to Recent, with eight species living today (Robinson, 2017a).

Subphylum Rhynchonelliformea Williams, Carlson, Brunton, Holmer and Popov, 1996
 Class Rhynchonellata Williams, Carlson, Brunton, Holmer and Popov, 1996
 Order Thecideida Elliott, 1958
 Superfamily Thecideoidea Gray, 1840

Family Thecidellinidae Elliott, 1958
 Genus *Thecidellina* Thomson, 1915

Type species: *Thecidium barretti* Davidson, 1864, by original designation of Thomson (1915).

Thecidellina persica sp. nov.
 Fig. 3D–M

Type material: Holotype, articulated specimen no. UIGM2004 (Fig. 3L–M); paratypes, one articulated specimen, one ventral valve and two dorsal valves no. UIGM2005–2008 (Fig. 3E–K).

Dimensions: Length 2.2 mm, width 2.0 mm, thickness 1.6 mm (holotype); length 2.2 mm, width 2.1 mm, thickness 1.4 mm (paratype, Fig. 3J, K).

Type locality: Ramsheh section, Central Iran.

Type horizon: Lower Red Formation, Early Oligocene, Rupelian.

Etymology: Referred to Persia, historical name of Iran.

Diagnosis: Small-sized *Thecidellina* species, roundish in outline. Ventral valve with striated, triangular, flat plano-

deltidium; ventral valve floor smooth without median ridge. Dorsal valve with long, narrow median septum, concave anteriorly; brachial bridge broad connected to peribrachial ridge; intrabrachial ridge clearly defined; cardinal process prominent, sub-rectangular without central lobe.

Material: Two articulated specimens, one ventral valve, and eight dorsal valves, including the type material.

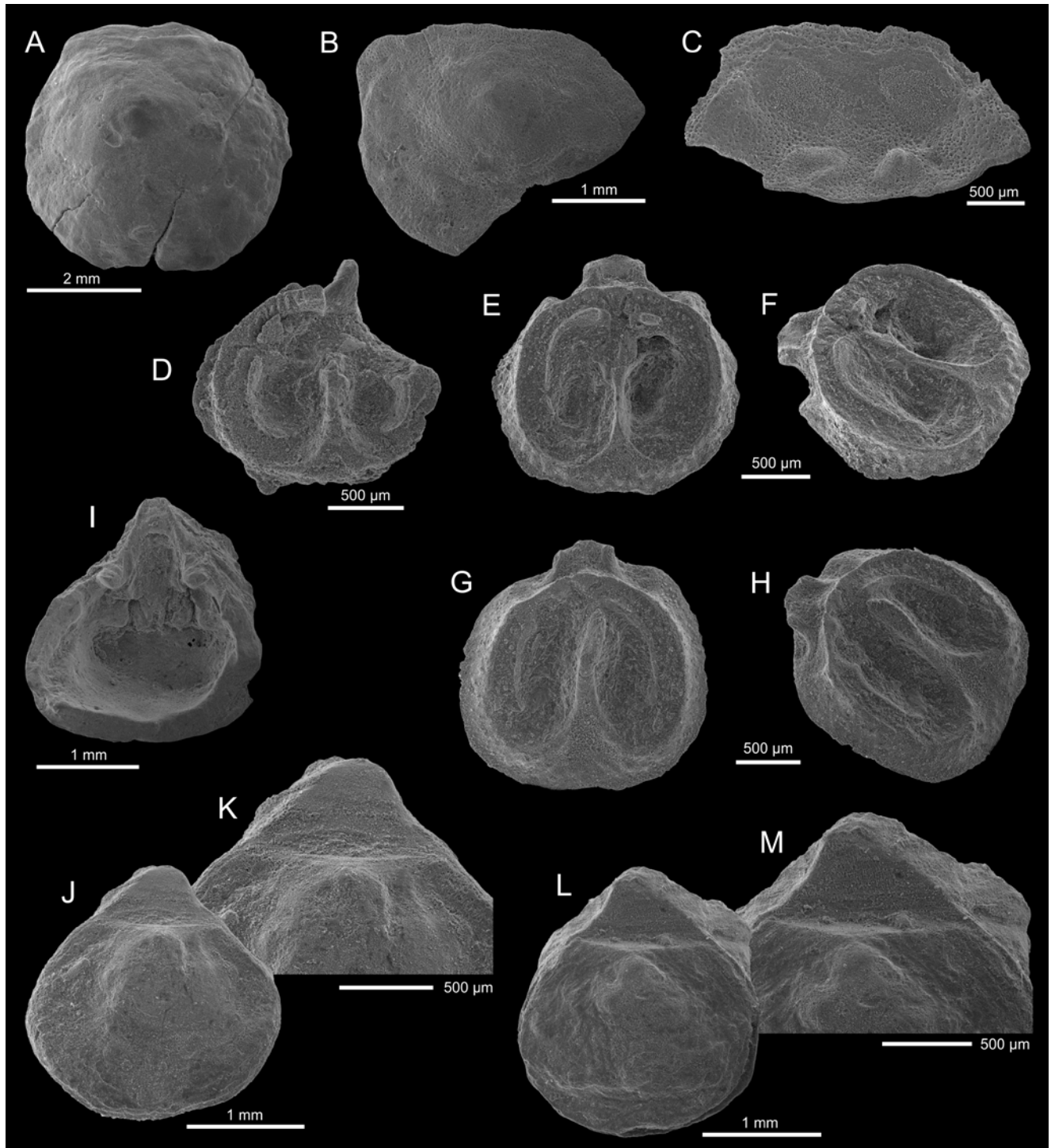


Fig. 3. Brachiopods from the Lower Red Formation, Early Oligocene, Ramsheh, Iran. **A–C.** *Novocrania* sp., dorsal valves; A, B – outer views, UIGM2001-2002; C – inner view of posterior part, showing rounded posterior adductor muscle scars, UIGM2003. **D–M.** *Thecidellina persica* sp. nov.; D – inner view of dorsal valve of young individual, UIGM2009; E–H – inner and oblique (F, H) views of dorsal valves, paratypes, UIGM2006-2007; I – inner view of ventral valve, paratype, UIGM2008; J–M – dorsal views of articulated specimens and enlargements (K, M) of umbonal part showing flat planodeltidium with transverse growth lines, J, K – paratype, UIGM2005, L, M holotype, UIGM2004. All are SEM images.

Description: Shell very small (maximum observed length 2.4 mm), roundish to oval elongated in outline, slightly longer than wide, strongly ventribiconvex. Shell surface rough, growth lines weakly marked. Interarea flat (plano-deltidium of Logan and Baker, 2013), triangular with parallel growth lines. Hinge line straight. Protegulum on dorsal valve distinct. Anterior commissure rectimarginate.

Ventral valve interior with large teeth, smooth floor without tubercles. No ventral median ridge or septum. Dorsal valve interior with single, long, narrow median septum, concave anteriorly. Brachial bridge broad connected to peribrachial ridge that is tuberculated in a better preserved specimen. Intrabrachial ridge well defined. Cardinal process prominent, sub-rectangular, projecting beyond the valve margin, spur (central lobe) not observed. Inner socket ridges in form of lateral lobes. Subperipheral rim wide, tuberculate.

Remarks: The material is mostly represented by detached dorsal valves. No trace of pseudodeltidium and a single, straight dorsal median septum confirm the assignment of the specimens from Ramsheh to the genus *Thecidellina*. The absence of a median ridge or septum in the ventral valve excludes their assignment to another thecidellinide genus with a flat interarea and long straight dorsal septum, *Kakamuiella* Lee and Robinson, 2003. This is not only the first fossil record of *Thecidellina* from Iran, but also its first record from Oligocene deposits (see Pajaud, 1970; Baker, 2006). Recent species of *Thecidellina* are characterized by a limited geographical range (Hoffmann *et al.*, 2009; Robinson, 2021, in press), thus the great stratigraphical and geographical gap between the hitherto described fossil *Thecidellina* species and the Oligocene material from Iran justifies the erection of a new species.

The absence of a spur on the cardinal process makes the Ramsheh specimens different from the majority of *Thecidellina* species, where a spur is usually well-developed. In size and outline the studied specimens are close to the Late Eocene *Thecidellina* sp. of Eua Island, Tonga, SW Pacific; however, the species from Tonga has a higher cardinal process, with a spur on the mid-line (Cooper, 1971). Also, the species *Thecidellina cooperi* Toulmin, 1940 from the Eocene of Alabama, USA, is similar in size and outline, but differs in having a well-developed spur and a higher median septum (Toulmin, 1940). Miocene and younger *Thecidellina* species are usually much larger than the specimens under study (Cooper, 1964, 1978, 1979). The Miocene *Thecidellina* cf. *maxilla* (Hedley, 1899) from New Zealand is close in size to the specimens from the Ramsheh section. However, it has a tri-lobate cardinal process and its dorsal median septum is higher and blade-like (Hiller, 2011; Robinson, 2017b).

Occurrence: Lower Oligocene Lower Red Formation, Ramsheh section, Iran.

Order Terebratulida Waagen, 1883
Superfamily Megathyridoidea Dall, 1870
Family Megathyrididae Dall, 1870
Genus *Argyrotheca* Dall, 1900

Type species: *Terebratula cuneata* Risso, 1826, by original designation of Dall (1900).

Argyrotheca ramshehensis sp. nov.

Fig. 4A–G

Type material: Holotype, articulated specimen, no. UIGM2010 (Fig. 4D–E); paratypes, articulated specimen, no. UIGM2011 (Fig. 4B–C), dorsal valve no. UIGM2012, (Figure 4F, ventral valve no. UIGM2013 (Fig. 4G).

Dimensions: Length 1.6 mm, width 1.6 mm, thickness 0.6 mm (holotype).

Type locality: Ramsheh section, Central Iran.

Type horizon: Lower Red Formation, Early Oligocene, Rupelian.

Etymology: After Ramsheh, the type locality.

Diagnosis: Small, smooth *Argyrotheca* with a shallow sulcus on both valves, beak high with a large, triangular foramen and very narrow interarea. Dorsal septum low with three serrations.

Material: 12 articulated specimens, one slightly broken ventral valve, and two broken dorsal valves, including the type material.

Description: Very small, thin shell, weakly biconvex, sub-circular to subpentagonal in outline. Shell surface smooth, coarsely punctate with weakly marked growth lines. In the anterior part, a broad, very shallow sulcus present on both valves. Beak high with sharp beak ridges and very narrow interarea. Foramen large, triangular, hypothyrid bordered by two narrow, slightly elevated deltidial plates. Hinge line long, straight.

Ventral valve interior with sessile pedicle collar supported by a short, slender median septum. Dorsal valve interior with short inner socket ridges and small but distinct cardinal process. Median septum low with three serrations. Loop not preserved.

Remarks: In size, outline and the presence of a shallow sulcus the specimens from Ramsheh are very close to the species *Argyrotheca punctulata* (Deshayes, 1860) from the Eocene of the Paris Basin. However, in the latter species, the foramen is smaller and oval, and its ventral valve interarea much wider (Deshayes, 1860, 1864; Cossmann and Pissarro, 1913; Pacaud, 2015). Also, the species *Argyrotheca robinsoni* Donovan, Harper and Doyle, 1993 from the Eocene of eastern Jamaica is similar in size and outline, differing, however, in having much wider interarea and a high, dorsal median septum (Donovan *et al.*, 1993). The smooth, subcircular *Argyrotheca oamarutica* Hiller, Robinson and Lee, 2008 from the latest Eocene/earliest Oligocene of New Zealand displays some similarities to the species described here but the differences are marked, both externally and internally; in *A. oamarutica* the beak is much lower with a smaller foramen and wider interarea and its dorsal median septum is very high, triangular without any serrations (Hiller *et al.*, 2008). Similar in outline, smooth surface and shallow sulcus *Argyrotheca altavillensis* (de Morgan, 1883) from the Eocene of France differs from *A. ramshehensis* sp. nov. in being larger and having a massive, very long dorsal septum (de Morgan, 1883; Pacaud, 2015).

Occurrence: Lower Oligocene Lower Red Formation, Ramsheh, Iran.

Argyrotheca cf. *collardi* (Baudon, 1855)
Fig. 4H–K

cf. 1855 *Terebratula collardi* – Baudon, p. 688, pl. 15,
fig. 7.

cf. 1860 *Argiope Collardi* Baudon – Deshayes, pl. 87,
figs 23–27.

cf. 1864 *Argiope Collardi* Baudon – Deshayes, p. 156.

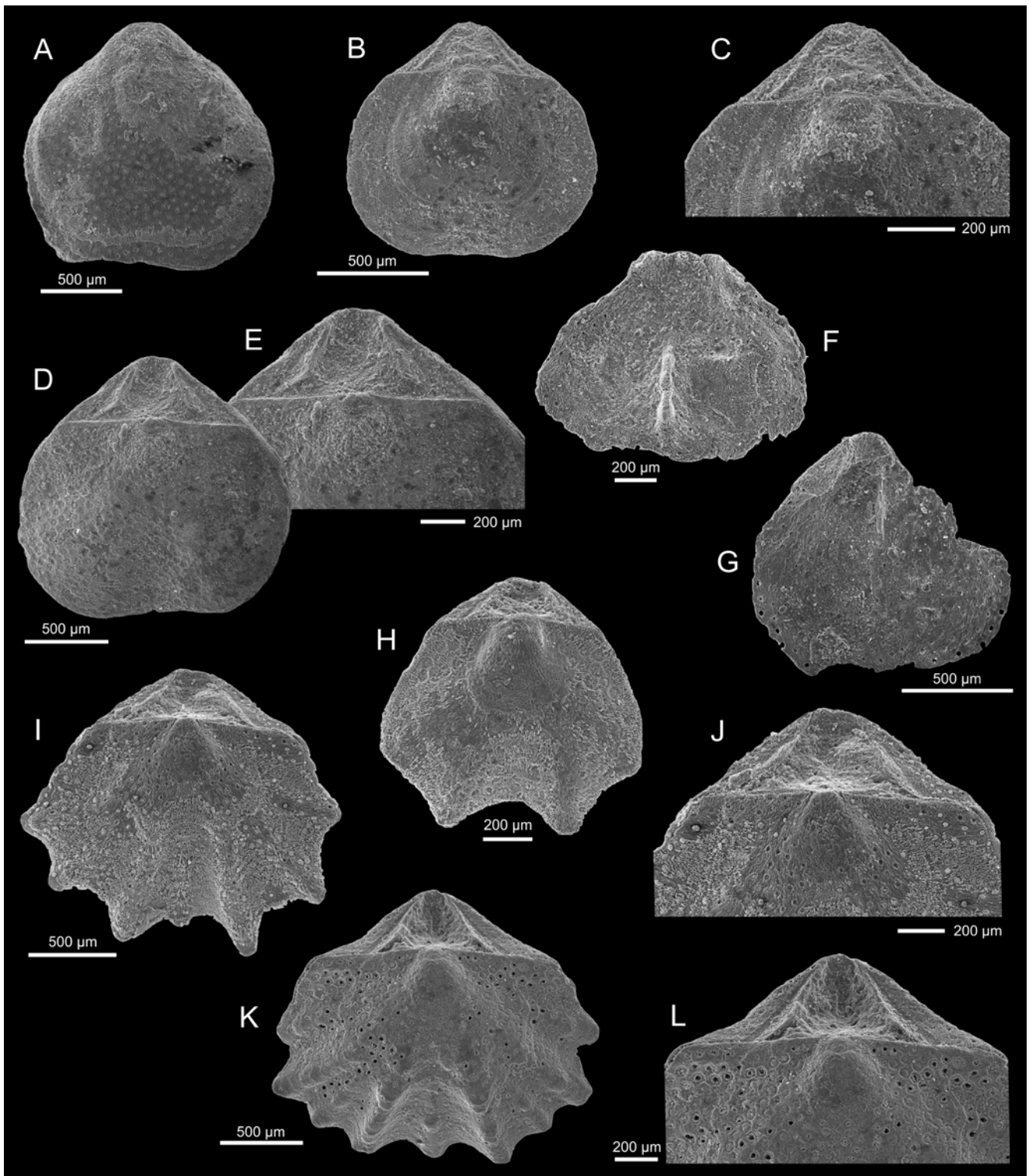


Fig. 4. Brachiopods from the Lower Red Formation, Early Oligocene, Ramsheh, Iran. **A–G.** *Argyrotheca ramshehensis* sp. nov.; A – ventral view of articulated specimen, UIGM2014; B–E – dorsal views of articulated specimens and enlargements (C, E) of umbonal part, showing details of the beak; B, C – paratype UIGM2011; D, E – holotype UIGM2010; F – inner view of dorsal valve, visible low septum with three serrations, paratype UIGM2012; G – inner view of ventral valve, partly broken, visible pedicle collar supported by a short, slender septum, paratype UIGM2013. **H–L.** *Argyrotheca* cf. *collardi* (Baudon, 1855); dorsal views of articulated specimens and enlargements (J, L) of umbonal part to show details of the beak, UIGM2015–2017. All are SEM images.

cf. 1913 *Cistella Collardi* Baudon – Cossmann and Pissarro, pl. 62, figs 5–8.

cf. 2015 *Argyrotheca collardii* (Baudon) – Pacaud, p. 77, pl. 4, figs 1–3.

Material: Eight articulated specimens, one broken ventral valve.

Description: Shell small (not exceeding 2.0 mm), thick, coarsely punctate, variable in outline from subtriangular to subrectangular, biconvex. Shell surface covered with broad, rounded ribs, 4 to 6 in number, forming scalloped anterior margin; in larger specimens intercalated ribs appear. Beak high with sharp beak ridges and narrow interarea. Foramen large, triangular, hypothyrid. Deltidial plates narrow, elevated. Hinge line straight, shorter than maximum width. Wide pedicle collar supported by a low median septum. Dorsal interior unknown.

Remarks: Several *Argyrotheca* species, with heavy, rounded ribs and scalloped margin, were described from the Paleogene of Europe (see Baudon, 1855; Deshayes, 1860, 1864; Cossmann and Pissarro, 1905, 1913; Pacaud, 2015). However, the internal structure was not investigated in any of them. In such a case, it is difficult to estimate the validity of all those species and certainly the material needs revision.

Externally, in shape and ornamentation, the specimens from Ramsheh are most close to *A. collardi* from the Eocene of the Paris Basin (Deshayes, 1860; Pacaud, 2015). However, the identification is tentative, as the interior has not been studied.

Occurrence: Lower Oligocene Low Red Formation, Ramsheh, Iran.

Genus *Joania* Álvarez, Brunton and Long, 2008

Type species: *Terebratula cordata* Risso, 1826, by original designation of Álvarez *et al.* (2008).

Joania peyrerensis Bitner, Lozouet and Cahuzac, 2013
Fig. 5A–J

2013 *Joania peyrerensis* n. sp. – Bitner *et al.*, pp. 592–594, fig. 7A–I.

Material: 12 articulated specimens, three ventral valves, four dorsal valves, some specimens are damaged.

Remarks: The investigated specimens correspond well, both externally and internally, to those described as *Joania peyrerensis* by Bitner *et al.* (2013) from the Late Oligocene of SW France. The specimens from Ramsheh, with the maximum length 2.5 mm, are slightly smaller than those from France. The shell is thick, subrectangular, ornamented by 6 to 8 distinct ribs. The dorsal median septum is high, triangular in profile, with four serrations (Fig. 4H). Marginal tubercles are well developed.

Occurrence: Lower Oligocene Lower Red Formation, Ramsheh, Iran. This species was originally described from the Late Oligocene of the Aquitaine Basin, SW France, and so far, it has been considered as endemic to that region (Bitner *et al.*, 2013).

Superfamily Platidioidea Thomson, 1927
Family Platidiidae Thomson, 1927

Subfamily Platidiinae Thomson, 1927

Genus *Platidia* Costa, 1852

Type species: *Orthis anomioides* Scacchi and Philippi in Philippi, 1844.

Platidia sp.
Fig. 5K–M

Material: Nine articulated specimens, two broken.

Remarks: This is the first record of the genus *Platidia* from the Oligocene of Iran, although this genus was already reported from the Miocene deposits of Iran (Pedramara *et al.*, 2019). The studied specimens are poorly preserved. Their internal structure is unknown, but externally they display typical features of the genus *Platidia*. The shell is very small, not exceeding 2 mm, subcircular in outline with a short, straight hinge line. Its surface is smooth with weakly marked growth lines. The foramen is large, rounded to oval, of amphithyrid type.

Occurrence: Lower Oligocene Lower Red Formation, Iran. The genus *Platidia* is known in the fossil record from the Paleocene (Johansen, 1987) and lives today in all oceans at depths of 8 to 2,190 m (Logan, 2007).

DISCUSSION

The Early Oligocene brachiopod fauna from Ramsheh, Central Iran, contains six species, belonging to five genera in four families. The families Craniidae, Thecidellinidae and Platidiidae have one representative each, *Novocrania* sp., *Thecidellina persica* sp. nov., and *Platidia* sp., respectively. The remaining three species, *Argyrotheca ramshehensis* sp. nov., *A. cf. collardi*, and *Joania peyrerensis* belong to the family Megathyrididae. Apart from *Novocrania* sp. and *Thecidellina persica* sp. nov. that live cementing to the substrate by the ventral valve, the remaining species have a functional pedicle opening and live attached to hard substrates. The co-occurrence of thecideide and megathyrid brachiopods is very common, both today and in the fossil record (e.g., Meile and Pajaud, 1971; Bitner *et al.*, 2013; Pedramara *et al.*, 2019). The studied brachiopods indicate a warm, shallow-water environment.

This is the first record of brachiopods from the Lower Red Formation of Iran. The discovery of *Thecidellina* in Iran is the first confirmed occurrence of this genus in the Oligocene deposits. This discovery fills the gap between its Eocene and Miocene occurrences. The Late Eocene–Early Oligocene *Thecidellina hedleyi* Thomson, 1915 from New Zealand was transferred by Lee and Robinson (2003), on the basis of the presence of a median septum in the ventral valve, into a new genus *Kakanuiella* created by them.

The oldest fossil record of *Thecidellina* is from the Paleocene of Alabama (Cooper, 1988). From the Eocene this genus is recorded from Alabama (Toulmin, 1940), from the Caribbean (Cooper, 1979), and from Eua Island, Tonga (Cooper, 1971). During the Miocene, it was common in the South-West Pacific, including Australia and New Zealand (Cooper, 1964, 1978; Lee and Robinson, 2003; Hiller, 2011; Robinson, 2017b), being also recorded from the Miocene

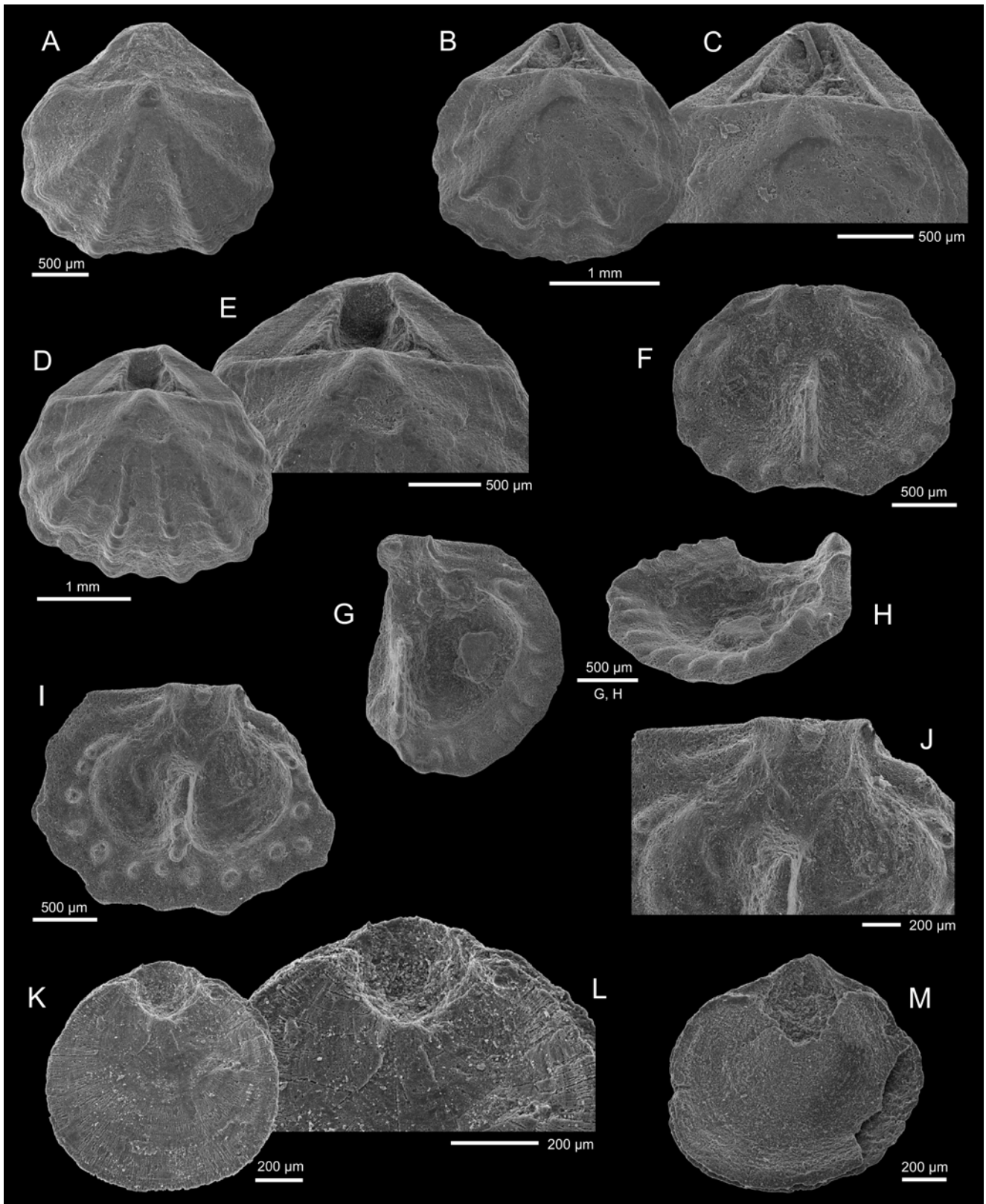


Fig. 5. Brachiopods from the Lower Red Formation, Early Oligocene, Iran. **A–J.** *Joania peyrerensis* Bitner, Lozouet and Cahuzac, 2013; A–E – dorsal views of articulated specimens and enlargements (C, E) of umbonal part to show details of the beak, UIGM2018-2020; F – inner view of dorsal valve, UIGM2021; G, H – broken dorsal valve, inner and oblique views, visible five serrations of the septum, UIGM2022; I, J – inner view of dorsal valve and enlargement (J) of posterior part, showing details of cardinalia and shafted cardinal process, UIGM2023. **K–M.** *Platidia* sp., dorsal views of articulated specimens and enlargement (L) of umbonal part to show amphythirid foramen, UIGM2024-2025. All are SEM images.

of Cuba (Cooper, 1979). Today *Thecidellina* is widespread, known in tropical and subtropical regions of all oceans, occupying warm-water, shallow, cryptic environments (Cooper, 1954, 1977; Lee and Robinson, 2003; Bitner, 2007, 2008, 2009, 2010, 2014, 2019; Logan, 2007, 2008; Lüter *et al.*, 2008; Hoffmann and Lüter, 2009, 2010; Hoffmann *et al.*, 2009; Logan and Bitner, 2013; Logan *et al.*, 2015; Simon *et al.*, 2018, 2019; Robinson, 2021, in press).

Interestingly, *Thecidellina* is not known in the Mediterranean Sea, and so far has not been found in the fossil record of Europe. The specimens from the Eocene of southern France, described by Pajaud in Pajaud and Tambareau (1970) as *Thecidellina dragonensis*, have a well-defined, convex pseudodeltidium, and thus were transferred to the genus *Minutella* Hoffmann and Lüter, 2010 (see also Bitner and Motchurova-Dekova, 2016).

In summary, from the Eocene and Miocene *Thecidellina* is noted from two far away regions, the South-West Pacific and Caribbean, including southern North America (Alabama), whereas in the Oligocene, it is known so far only from Iran, and it is not found in the fossil record of Europe. Such a pattern is difficult to understand. One cannot exclude, however, that because of its very small size, it is simply an effect of *Thecidellina* being overlooked during studies. In modern waters, *Thecidellina* is widely distributed, being represented by 14 species.

In taxonomic composition, the brachiopod fauna from the Lower Red Formation differs strongly from that described from the Lower Miocene deposits of the Qom Formation (Pedramara *et al.*, 2019; Bitner *et al.*, 2023), having no species in common. However, the genera *Argyrotheca*, *Joania* and *Platidia* were recognized in both assemblages. After all, the brachiopods from Ramsheh seem to be closer to the Eocene and Oligocene brachiopods of Europe (Pacaud, 2015). Until the closure of the Tethyan Seaway during the late Early Miocene (Harzhauser *et al.*, 2007), the Iranian Province constituted a part of the Western Tethys Region, with connections to the Atlantic and Indian oceans, so that faunas could migrate freely within the region.

CONCLUSIONS

This study describes a previously unknown brachiopod fauna of the Lower Oligocene Lower Red Formation of Iran. Five genera from four families are described: *Novocrania*, *Thecidellina*, *Argyrotheca*, *Joania*, and *Platidia*. Two species, *T. persica* sp. nov. and *A. ramshehensis* sp. nov. are proposed as new to science. The genera *Novocrania* and *Thecidellina* are reported for the first time from Iran. Additionally, this is the first report of *Thecidellina* from the Oligocene, filling a gap in taxonomic knowledge of this genus. The Ramsheh brachiopod fauna differs from that described from the Lower Miocene Qom Formation, having no species in common, and showing more affinity to the Eocene and Oligocene brachiopods of Europe.

Acknowledgements

The authors are grateful to the Department of Geology, Faculty of Science, University of Isfahan, for providing laboratorial and field trip logistics. A. Holda-Michalska (Institute of Paleobiology, Warszawa) is thanked for assisting in the preparation of Figures 1 and 2. We thank the reviewers Jeffrey H. Robinson (University of Otago, New Zealand) and Alfréd Dulai (Hungarian Natural History Museum, Hungary) for careful reading of our manuscript and their valuable comments and suggestions.

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