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Paleozoic Stratigraphy and Petroleum Systems of the Western and Southwestern Deserts of Iraq

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On page 232, in Figure 2, the Ga'ara Formation is incorrectly shown to be present in the "Outcrop North Iraq" column. The Ga'ara is not reported in this area.

In Figure 2, Lower Carboniferous rocks are incorrectly shown to be absent in Akkas-1. On page 239 the same sequence is correctly translated from Al-Haba et al. (1994) to be 358 meters (m) thick in Akkas-1, and to correspond to the Kaista, Ora and Harur formations. In their original figure the section is shown as Tournaisian to Namurian and to consist of sandstone and shale.

Also in Figure 2, the succession shown for Rumaila-172 is incorrect. Rumaila-172 well reached a total depth of 5,365 m within the Lower Jurassic Butma Formation. The succession shown for Rumaila-172 was predicted by Al-Siddiki et al. (1994) for a deep proposed well in the Rumaila field which was not drilled.

On page 233 the fossils *Billingsella sp.* and *Lingula sp.* are mis-spelled as *Pillingsella sp.* and *Bingula sp.*

On page 234, in Figure 3 overleaf, the contents of the column "Acritarchs" should be moved one row downwards. Also *V. subglobosum* is mis-spelled as *Y. subglobosum*.

On page 240 (last paragraph) it is stated that the Total Organic Carbon (TOC) of the Silurian "hot" shale in Akkas-1 ranges from 0.96% to 16.62%. This is correctly translated from Al-Haba et al. (1994). The peak TOC occurs at a depth of approximately 2,200 m but is not shown in the figure of the Al-Haba et al. which was reproduced in Figure 6.

The description of the Khlesia-1 well on page 239 is confusing. The following is the detailed account from Buday (1980, spelled Khleisia in Buday) and the Arabic paper by Al-Haba et al. (1994).

Buday (1980) attributes to Gaddo and Parker (1959 unpublished report) a 257-meter section in Khlesia-1, consisting of marls, mudstones, calcareous siltstones, sandstones with conglomerates at the base, to the "Khleisia facies". He correlates it to the Upper Devonian-Lower Carboniferous Kaista Formation based on two unpublished reports by Gaddo and Parker (1959) and Ditmar et al. (1971). Buday indicates that no fossils were recorded in this section which could partly represent age and facies equivalents of the Pirispiki Red Beds.

Buday (1980) describes the overlying Ora Shale Formation in Khlesia-1 as similar to the type section. The type section is over 220 m thick and consists of dark calcareous shales with interbeds of silty marls, lentils of organic detrital limestones and fine-grained limestones. In Khlesia-1, the total thickness is 486 m which includes a transitional facies of limestone and dolomite interbeds. Buday (1980) describes the overlying Harur Limestone in Khlesia-1 as 120 m thick and consisting of bedded limestones, dolomites with thin interbeds of shale and silty shale.

Al-Haba et al. (1994) identify an unnamed section 387 m thick in Khlesia-1 and attribute an Early Carboniferous (Tournaisian) age to it. They do not identify any Upper Devonian section. In contrast, Buday (1980) attributes a total thickness of 863 m to the Kaista (257 m), Ora (486 m) and Harur (120m). The difference between the thicknesses (387 m versus 863 m) for the ?Upper Devonian-Carboniferous is due to ambiguities in the interpretation of the Devonian-Ordovician rocks in this well.

SYSTEM	SERIES	LITHOLOGY	INFORMAL BIOZONES	ASSEMBLAGE OF PALYNOMORPHS		
				SPORES	ACRITARCHS	CHITINOZOA
PERMIAN	Upper	Chia Zairi	"P1"	S. lateralis, I. labrata, P. novicus, V. densus S. richteri, P. papilionis, F. fimbriatus Osmandacites spp., Campotritiletes spp. D. insolitus, F. zapfei, F. milloti		
			"P2"	D. levis, P. incomptus, C. hartungiana, G. microgranifer, C. micaceus, L. cestus, E. aggrensis, M. tentula, C. saturni, D. solidus, P. minutus, T. obscura		
CARBONIFEROUS	Upper	Ga'ara	"CP1"	D. priddi, C. mutabilis, C. pallida L. commissuralis, R. aculeata, C. plicata, Densosporites sp., A.C. rarus, S. arenaceous, S. triangulatus, K. ornatus, V. vallatus, L. trileta, P. westphalensis, Q. diversiformis, P. sewardii		
DEVONIAN	?	Harur	"DC1"*	A. splendidus, S. lybicus, D. emsiensis D. muresdensis, Ambitisporites spp., Retusobiletes spp.	C. pilar, D. denticulata Leiofusa spp., Geron sp.	
		Ora				
SILURIAN	Ludlovian	Suffi	"S1"	A. avitus, A. chulus E. rotatus, A. miserabilis	N. carminae, C. pilar, L. laevigata D. milliepedi, D. denticulata V. dilatispinosa, L. estrecha	A. ancyrea, P. carminae P. saharica, S. sphaerocephala A. valentini, A. echinata
	Wenlockian	Akkas	"S2"		D. furcata, D. bispinosa, O. eoplanktonica, Q. fantasticum, D. maranhensis, D. monterosae	F. fungiformis C. arnilata
	Llando-verian					
ORDOVICIAN	Ashgillian	Khabour	"O1"*	V. subglobosum, V. irroratum, V. oklahomense E. striata, V. setosapeli		A. nigerica
	Caradocian					
				* Expected		

Figure 3: General Paleozoic succession of Iraq based on published palynological data, particularly from the subsurface.

REFERENCES

- Al-Haba, Y., A. Al-Sammarai, F. Al-Jubori, N.N. Giorgis and I.M. Ahmed 1994. *Exploration for the Paleozoic Prospects in Western Iraq, Part 1: Exploration of the Paleozoic System in Western Iraq*. Proceedings of the Second Seminar on Hydrocarbon Potential of Deep Formations in the Arab Countries. OAPEC, Cairo, 10-13 October (in Arabic).
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