

## **Seleucid Mintage: A Pattern for Parthian Coinage**

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### **Abstract**

**Silver coins of Alexander of Macedonia, until the arrival of Parthians in the 1<sup>st</sup> century BC, have been put in WDXRF in order to determine Ag, Cu, Pb and Au as major and trace elements for fineness, debasement and refinement of silver in ancient Persia.**

**Seleucid kingdom from 4<sup>th</sup> to 1<sup>st</sup> century BC was succeeded by several dynasties and kings. But the chemical composition of their silver coins and their fineness shows there was no changes in technology and economic policy.**

**Keywords: Alexander, Seleucid, Parthian, Mithradates I, WDXRF, Coins**

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### **Introduction**

Alexander the Great, after defeating Achaemenid king Darius III, extended his power to India. When Alexander faced paucity of coins, he simply re-melted the hordes of treasures from his recently captured domain like Susa palace of Achaemenian (Badian, 1993:420-501).

His death in Babylon in 323 BC led to the division of his vast empire among his successors hence; Persian realm was inherited by his general Seleucus I in 312 BC (Bickerman, 1993:3-20).

Seleucus I (312-281 BC) continued the policy of his predecessor but when Seleucids faced economic crises like Alexander, they re-melted golden objects of holy places. Among them, Antiochus IV Epiphanies (175-164 BC) is said to have coveted treasures of a temple of Elymais (Bivar 1993:21-99).

The essential unit was the silver piece of tetradrachms, with about 17<sup>th</sup> grams of weight. There were several Iranian cities which reportedly issued coins of their own choice and legends.

Seleucid gradually gave up their territory to Parthian and returned to the west and finally subdued by Romans. At beginning, Parthian king Arsaces I (248-211 BC) occupied the Seleucid mint and issued coins in his name but maintained the fineness of previous era.

Extension of Parthian to the north-west and north-east of Iran must be credited to Mithradates I (171-138 BC). His territorial gain both westward, Mesopotamia and eastward to

Bactria caused the emergence of several mint houses (Sellwood 1980:29-43). Possibly his generals invaded Elymais and the temples of Athena and Artemis and acquired tens of thousands talent of treasure (Bivar 1993:21-99). Their coins on the reverse bore monogram, which seems to be a mark of mint houses.

While going through Achaemenid silver coins, Cowell (Cowell, 1986:89) conducted spectroscopy of silver coins of Sigloi - a hoard found in Babylonia dated to early 4<sup>th</sup> Century BC - by X-Ray Fluorescence. For their debasement, copper were added from 1.5 % till 2.8 %. Recent work of Gondoneau and others (Gondonneau, A., et al 2002:369-374) on the Persian and Macedonian coins from Darius to Alexander has well described the traces of gold for debasement and fineness. In another work by N Kallithrakas-Konotos and others on tetradrachms of Alexander minted in Macedonia (Kallithrakas-Konotos, N., & et al 2000:342-349) reported that the silver contents (96-98 %) shows the coins were minted in bullion form. Vijayan on Indian Punch marked silver coins (Vijayan 2004:355) issued by the contemporary of Alexander and his successors, showed that %age of silver in these coins varied between 68 to 86 %. But these punch marked coins never found with Alexander or his successors. On the other side, in the same era (Uzonyi 2000:748-752), the silver drachms of two Greek cities of Illyria of 2<sup>nd</sup> and 1<sup>st</sup> century BC showed variation of 90 to 85 % of silver.

Clay has analyzed silver coins of (Clay 1955:1-111) Parthian by wet chemical methods but his restricted methods could detect very few trace elements.

**Research Methods**

In order to check the hypothesis of the present research the silver coins have been selected according to the accession of Seleucids and latter by Parthians to see if there was any deference in chemical composition of their silver coins or extraction techniques. For this purpose, samples were selected from the cabinet of coins from

National Museum of Tehran, has been identified with Sellwood catalogue (S means Selwood), to avoid any counterfeited issues. For spectroscopy, the selected coins (Table 1) were placed on the basis of their different types (Plate1&2), weights and chronological order.

Due to limitation of the current study, X-Ray Fluorescence has been used as instrument for the silver metallic pieces. This instrument from Philips company model PW 2404 has the detection limit of +\_1ppm and its analysis process is fully quantitative.

**Table1** Chronological study of coins according to Selwood and Hoover

Coin No	Kings	Date of reign	Place of mint	Reference
1	Alexander	336-23 BC		
2	Alexander	336-23 BC		
3	Alexander	336-23 BC		
4	Alexander	336-23 BC		
5	Seleucus I	312-281 BC		
6	Seleucus I	312-281 BC		
7	Seleucus I	312-281 BC		
8	Antiochus III	223-187 BC		
9	Alexander Balas	150-145 BC		
10	Alexander Balas	150-145 BC		
11	Demetrius	162-150 BC		
12	Antiochus VII	139/9-129 BC		
13	Antiochus VII	139/9-129 BC		
14	Mithradates I	171-138 BC	Hecatompylos	S8.1
15	Mithradates I	171-138 BC	Hecatompylos	S10.1
16	Mithradates I	171-138 BC	Unknown	S10.1
17	Mithradates I	171-138 BC	Hecatompylos	S10.1
18	Mithradates I	171-138 BC	Hecatompylos	S10.1
19	Mithradates I	171-138 BC	Hecatompylos	S10.1
20	Mithradates I	171-138 BC	Hecatompylos	S10.1
21	Mithradates II	123-88 BC	Hecatompylos	S24.9
22	Mithradates II	123-88 BC	Ecbatana	S27.1
23	Mithradates II	123-88 BC	Rhagae	S27.1
24	Mithradates II	123-88 BC	Rhagae	S7.1

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**Table 2** Result of spectroscopy XRF

Coin no	Silver	Gold	Copper	Lead	Bismuth	Zinc	Iron
1	90.753	0.486					
2	79.888	0.293	0.172				
3	93.074	*	0.235	0.633	0.33		
4	37.651	1.204	*				
5	61.809	*	21.658			1.51	
6	83.934	0.498	0.196				1.197
7	74.848	1.555	9.64				1.282
8	96.434	0.846	*			0.163	
9	88.367	0.707	2.045	0.9			
10	92.593	0.665	3.708			0.272	
11	94.437	0.519	1.089			0.349	
12	86.028	0.302	8.482				0.406
13	93.779	0.9	0.357			1.688	
14	92.835	*	3.246				
15	90.863	*	1.601				0.246
16	95.388	0.303	1.353				
17	95.376	0.229	2.317			0.105	
18	96.329	*	2.175				
19	91.391	*	1.267			5.312	
20	96.869	0.354	0.461				
21	89.228	*	7.54			0.55	
22	87.824	0.721	2.436				
23	65.995	0.233	4.94				
24	95.671	0.629	2.095				



**Plate 1** Alexander and Seleucid coins



**Plate II** Parthian coins

### **Result**

According to the spectroscopy results, selected coins show the chemical composition as an indication of political succession during three centuries before Christ. Adding copper to silver coins shows political variation within a dynasty. Also, presence of copper as trace elements in silver coins of Alexander shows highest fineness of silver coins of him.

Variation of silver contents from Seleucus I onward shows political ups and down. Seleucid coins do not indicate any high debasement in silver and the same with the case of Parthian who had the similar debasement.

Gold impurities show nearly all the coins have had used lower gold contents. Only coins

4<sup>th</sup> and 7<sup>th</sup> have higher percentage of gold compare to other coins.

The presence of very low lead in the silver coins shows silver were extracted with excellent technique hence; there was no decline in method of extraction during those four centuries. Zinc has been found in several coins especially from Parthians.

### **Discussion**

The spectroscopy on the selected silver coins of Alexander III till Mithradates II is a kind of short study which gave additional information about the history of Persia. Silver coins minted by these kings show not much variation in their contents.

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Alexander's silver coins like his gold issues (Gondonneau, A. Nicolet-Pierre.H & et al 2002:369-347) in comparison to other mint houses (Kallithrakas- Konotos.N., & et al 2000:342-349) and other Greek cities (Uzonyi.I. & etc, 2000:748-752) do not show any differences, however, they are not similar to the contemporary silver issues of Indian punch-marked (Vijayan 2004:356) coins.

As the Achaemenid silver coins of 4<sup>th</sup> century BC (Cowell 1986:89) shows copper as addition, which lacked in Alexander's issues. Antiochus III and his successors added copper, intentionally.

Gold coins four and seven seem to be higher compared to the other coins, possibly is indication of another sources of metallic ores.

Lead presence in those silver coins in compare to Indian Punch coins (Vijayan. V., & et al 2004:355) shows very better extraction of silver. Compare to silver extraction during Greeks and Macedonian, lead as impurities, are nearly in the same percentage. Probably extraction methods were similar to Greeks techniques.

Zinc has been reported from several coins. It shows that the copper which added to the silver coins had impurity of Zinc (Clay. E.1955:1-111).

Trace elements of HinduShahi of 10<sup>th</sup> and 11<sup>th</sup> centuries of Afghanistan have the similar (Hajjivaliei.M. & et al 1999:645-650) trace elements.

### **Conclusion**

The study shows that Alexander's coins which minted according to the nature of his invasion, change its chemical composition.

Silver coins by Antiochus III had copper metal as intentional addition which shows political settlement in Persia. Gradually, Parthian took Seleucid mint houses and Mithrdates I and II occupied all the Seleucid mint houses. Chemical composition of these kings shows Parthian did not change economic policy established by Achaemenid and Seleucid.

In sum, it can be said that Seleucid and Parthian continued economic policy of previous rulers and only Alexander kept his coins in the form of Bullion.

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## سکه زنی سلوکیه الگویی برای ضرب سکه های اشکانی

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سکه‌های نقره‌ای اسکندر مقدونی که ضرب آنها تا قرن اول ق.م، یعنی زمان حکمرانی اشکانیان ادامه یافت، به وسیله دستگاه طیف سنج تابش مجهول طول موجی برای اندازه گیری میزان نقره، مس، سرب و طلا در این سکه‌ها مورد آزمایش قرار گرفتند. هدف ما از این آزمایش اندازه‌گیری درصد عناصر نادر و عناصر عمده در این سکه‌ها و از این طریق تعیین میزان دقت در ساخت سکه‌ها، میزان ناخالصی آنها و فناوری تصفیه نقره استخراج شده در ایران بود.

پادشاهانی که سکه‌های آنها در این پژوهش مورد بررسی قرار می‌گیرد از قرن چهارم تا قرن اول ق.م بر تخت سلطنت نشسته‌اند. ترکیبات شیمیایی سکه‌های نقره این پادشاهان و تعیین میزان خلوص آنها نشان می‌دهد که هیچ گونه تغییری در فناوری استخراج نقره و سیاست‌های اقتصادی در دوره‌های مورد بررسی ما صورت نگرفته است.

واژگان کلیدی: اسکندر، سلوکیه، اشکانی، مهرداد اول، WDXRF، سکه

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