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**COINAGE GENESIS IN THE CONTEXT
OF THE POLITICAL AUTONOMY
ON THE LITHUANIAN-HORDE BORDER LANDS
the second half of the 14th – the first half of the 15th century**

The article is represented genesis of the coinage on the lands of the Lithuanian-Horde borderlands. Juchi coin system which had been fixed on the territories of Lower Dnieper region, gave impulse to the restoration for local coinage both in Rus' principalities and the south-eastern part of the Grand Duchy of Lithuania. At the initial stage it became an example in the technological, iconographic and economic aspects of local land minters.

Changes in political conditions influenced mainly on the external characteristics of a specific monetary material, but its metrological indicators (weight and fineness) remained practically unchanged. The explanation lies in the main purpose of a local coin issuing. It was in meeting the needs of the local market (for ordinary emissions) or emergency filling of the local treasury (military money, etc.). Traditional weight standards served as a pass for a coin into the money market. However the possibility of local minting was caused by the fact of a certain autonomy as well as the right to coin regalia. The termination of the local coins (original or imitation) minting often meant a legal loss of economic and political independence.

Keywords: numismatics, coinage, mint, metrology, weight, miskal, dang, groshen, money market, Grand Duchy of Lithuania, Uls Juchi, border lands.

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ГЕНЕЗИС МОНЕТНОЇ СПРАВИ У КОНТЕКСТІ ПИТАННЯ ПРО ПОЛІТИЧНУ АВТОНОМІЮ НА ЗЕМЛЯХ ЛИТОВСЬКО-ОРДИНСЬКОГО КОРДОНУ друга половина XIV – перша половина XV ст.

Джучидська монетна система, затвердившись на подніпровських територіях, дала поштовх для відновлення місцевого карбування руських князівств та в південно-східній частині Великого князівства Литовського, ставши на початковому етапі прикладом у технологічному, іконографічному та економічному аспектах для місцевих карбувальників. Метою даної публікації є презентація генезису монетної справи на землях литовсько-ординського прикордоння. Головний акцент зроблено на характеристиці грошово-вагової системи.

Після ряду реформ у грошовій справі за часів хана Токти та Узбека, майже всі відомі у той час монетні двори Улусу Джучі випускають срібну монету – данг, – яка являє собою 1/6 частину від рахункового динара вагою в 2 мискала срібла. Протягом всього існування, вагові характеристики монет змінювались внаслідок зміни значення вагового міскала.

Нестача повноцінних грошей в обігу, карбованих офіційно володарями права монетної регалії, компенсувалася карбуванням регулярних та нерегулярних місцевих наслідувань, що обслуговували, передусім, повсяк-

денний грошовий обіг (дрібний опт, роздріб, послуги та інші дрібні операції). Часто такі випуски ставали основою для створення подальшого місцевого карбування і представляли собою чітко вибудований ланцюжок з оригінальних номіналів та типів. Зразковим є випуск у Київському князівстві імітацій, що нагадували джучидський данг з ім'ям Джанібєка, карбований у Гюлістані 753 року Хіджри. Спроба визначити міскал якої ваги було покладено у основу емісії, привела лише до висновку, що найближчим є міскал вагою у 4,26 грам. Проте, багато монет не підпадають під цю, чи інші визначені норми, тому питання про вагову систему, по якій було зроблено випуск цих монет досі лишається відкритим.

Наступним етапом став випуск у Києві була проведена від імені литовського князя Володимира Ольгердовича. Ці емісії також поки не піддаються детальному метрологічному аналізу та визначенню стопи та вагової системи. Вони дуже схожі на попередні випуски, але мають значно менше вагових груп.

Нумізматичні джерела з історії Київського та Сіверських князівств другої половини XIV – початку XV століть свідчать про активний розвиток власної монетної справи тільки до часу укладання Крєвської унії. Після неї грошове виробництво на вказаних територіях іде на спад. Також це виявилось у припиненні карбування руських грошиків у Львові на початку XV століття.

Зміна політичних умов впливала головним чином на зовнішні характеристики удільного монетного матеріалу, однак його метрологічні показники (вага і проба) лишалися практично незмінними. Пояснення криється у основній меті випуску місцевої монети – задовольнити потреби місцевого ринку (для ординарних емісій) або екстрено наповнити місцеву скарбницю (військові гроші тощо). Традиційні вагові норми слугували перепусткою монеті у грошовий ринок. Однак, сама можливість місцевого карбування, природно, впливала з факту певної автономії, а звідси і права на монетну регалію. Припинення карбування місцевих монет (оригінальних чи то наслідувань) часто означало юридичну втрату економічної та політичної незалежності.

Ключові слова: нумізматика, монетна справа, карбування, метрологія, вага, міскал, данг, гріш, грошовий ринок, Велике князівство Литовське, Улус Джучі, прикордоння.

Political history and the economy development of the Grand Duchy of Lithuania in the second half of the 14th – early 15th century can not be considered without taking into account the rapid extension of its territory to the south and south-east as well as close political and economic contact between Lithuanians and Juchi Ulus with Rus' principalities, the ruins of Kievan Rus, subordinated to it.

Since the 40's of the 13th century the territory of Kyiv, Pereyaslavl, Chernihiv, Novhorod-Siversky principalities and the parts of the Dasht-i-Kipchak had been included into Ulus. Via the peculiarities of Juchi Ulus state system most of the captured Rus' lands with established territorial boundaries retained the local

administration subordinated to Ulus. Besides, the institutions of external management and income collection (*baskaki*) were added to it (Rusyna, 1998: 34; Rusyna, 2008; El'nikov, 2001; Yel'nykov, 2008). One of the most important moments in the economy of the Ulus was *the proper coinage* which began in the middle of the 13th century in several centers at the same time and had territorial features, weight standards and principal schemes of the monetary system. With the strengthening of central government and the merging uluses in one economic space, *the unification of the monetary system and single weighing standard* are introduced. However, several centers as Azaq and Khwarizm (Urgench) continue to mint a coin of another weight (Map 1).

It is known that there were different relics of the monetary counting in the affiliated territories, those ones which had left since the times of Kievan Rus' and contributed while the existence under Ulus Juchi power. Juchi coin system which had been fixed on the territories of Lower Dnieper region, gave impulse to the restoration for local coinage both in Rus' principalities and the south-eastern part of the Grand Duchy of Lithuania. At the initial stage it became an example in the technological, iconographic and economic aspects of local land minters.

The coin case has never been a special object of numismatic research in the marked territory. The main sources are coin material.

The purpose of this publication is to present the genesis of the coinage on the lands of the Lithuanian-Horde borderlands. The main emphasis is on the characteristics of the money and weight system.

We propose to start the presentation of the main material with a brief overview of the key stages in the history of the monetary economy properly Juchi state (Table 1.).

It is known that the proper coinage by the Mongols on the territory of the future Juchi Ulus was set up during the time of the unified Great Mongolian Ulus (Ulugh Mongol Ulus). During the time of Berke reign and the establishment of the independent Juchi state the minting was started in key ulus centers from east to west – Khwarizm, Sarai, Azaq, Qrim and, later, Saqchi. On Map 2 we have presented almost all centers of Juchi Ulus coinage while its existence, which gives us an idea of the political boundaries of the state formation.

After the series of monetary reforms in the times of Toqta and Uzbek Khans almost all the well-known mints issued silver coins *dang* which is 1/6 of the *dinar* weighing 2 *miskals* of silver.

Throughout their existence the weight characteristics of coins have been changed because of changing the value of the weight *miskal*.

To service small cash operations in their own market all mints stamp a copper coin that has a clearly recognized exchange rate of "16 *puls* equal to 1 *dang*". This *dang* was a counting unit of the *miskal* 1/6 and for the whole time of the coinage it had different names. They are reflected on some silver and copper coins: *dang*, *akche*. I.e. the silver coin "*dang*" was equal to 32 copper *puls*.

Since the middle of the 14th century Juchi Ulus had entered into the period so-called as "great confusion". Together with a plague pandemic it leads to significant changes in the western part of Ulus. A well-established scheme of caravans in the direction of "east – west" had been broken. Again as it was in the times of Kievan Rus, the priority of the direction "south-north" returned. Together with the reorientation of trade routes direction the economic significance of the regions that were still on the periphery of economic and political boundaries, grew. It is quite visible due to the analysis of monetary discoveries. Until that moment receipts of Juchi coins was negligible on the lands which later form a significant part of the Lithuanian-Horde border. From the side of Juchi Ulus it led to the appearance of coin production in the territories that controlled the revived or newly laid out trade routes – soqmas. Cities similar to Shehr al-Jadid, a large settlement near the modern Costesti (Moldova) and a fortress near Balykleja in the Southern Buh, become such centers.

In general while assessing the composition of the local money market since the middle of the 14th century we can see an interesting distribution of the coin according to the market directions. **Prague groschens and ingots:** tatar sommas and hryvnias (Novgorod and Lithuanian) served *international trade operations* in the west and north. **Juchid dangs:** served east and south *international trade operations, regional and local markets*. **Lviv half groschens (pivgrish) or Rus groschens (groshyk):** served *the regional market*, which connected the Galician kingdom with the principalities in the territory of the Dnieper region.

At the local market small operations were served by small denominations: in the territory of the principalities: **Lithuanian denariuses** and **local imitation** of Juchi coins; in the territory of Juchi Ulus copper coins **puls**. It was a credit coin which was in circulation at the established rate: 16 puls – dang (counting dang = 0.78 grams), or 32 coins per silver minted dang. However in the borderlands copper coins were not accepted and were not used in circulation.

Therefore the presence or absence among finds on certain territories of Jucid copper coins is a peculiar indicator of the fact that such territory belonged to the lands of Juchi Ulus, or to the lands which were subordinated to Ulus, but with rather self-developed economic relations. Along with the local market **Kyiv imitation of the Jani Beg coins** were quite widespread in the territory of Volyn. A few finds of single coins are known in Western Belarus and the Crimea. Juchid small silver fractions had not been distributed in the region which was selected for this research, therefore they had no influence on the money circulation.

In the late 60's the Ordu became the capital of the western part of Juchi Ulus. It was located on the Dnipro river below the rapids Kuchugurske hillfort (item 2 on Map 2). A significant amount of coins minted in this center subsequently leads to the dissemination of local imitations for silver dangs Ghiyath al-Din Muhammad, the Ordu minting in 772 – 777's of Hijra on the vast territory of the Lithuanian-Horde

border. Such imitations are known by their origin from the territory of Siversk principality and constitute the beginnings of princely minting in this territory.

On the place near a convenient crossing across the Siversky Donets river at the same time another one Ordu, which has close ties with Shehr al-Jadid on the Dniester, begins to mint.

The lack of full value moneys which were minted officially by the right of the monetary regalia was offset by the minting of regular and irregular local imitations. First of all it's served daily money circulation (small wholesale, retail, services and other small operations). Such issues often became the basis for further local minting and represented a distinctly constructed chain of original denominations and types.

The establishment of old trade routes through the Kyiv principality and the lack of a circulating coin to satisfy the money market forced the local authorities to begin issue of their own imitations, reminiscent of the Juchid dang with Jani Beg name which had been minted in Gulistan in 753's of Hijra. This issue which was conducted approximately in 1355 – 1366 is a unique phenomenon nowadays. Considering that the local market did not accept a copper coin, the issuer decided to saturate the local market with a large number of small fractions from Juchid dang. Today the smallest known coin of this type weighs 0.09 grams.

We tried to determine the miskal of which weight was the basis for the issue, but only came to the conclusion that the nearest is the miskal weighing 4.26 grams. However many coins do not fall under this one or other defined norms, so the question as for the weight system on which the issuance of these coins had been produced is still open.

The next issue in Kyiv was held on behalf of the Lithuanian Prince Volodymyr Olgerdovych. 5 types of coins are identified (Table 2). Volodymyr's emissions are not yet the subject for detailed metrological analysis and determination of coin stop as well as weight system. They are very similar to previous issues but have significantly less weight groups.

While Volodymyr Olgerdovich reigning Kyiv land had already become a part of the Grand Duchy of Lithuania. However he freely enjoyed the right of the coin regalia. The main feature of these coin issues is the placement of the so-called "prince's sign" on the reverse and the named legend on the obverse. Thus the official right of the prince to the cash issue was emphasized. It is the last phenomenon which is the final phase in the formation of the local monetary affair.

And here it is worth mentioning one of the important events in the political and economic life of the Grand Duchy of Lithuania which also influenced on the development of the monetary economy. It was the Union of Krewo (Act of Krewa) in 1385.

Numismatic sources from the history of the Kyiv and Seversk principalities of the second half 14th and early 15th centuries, representing the coinage of Kyiv Prince Volodymyr Olgerdovich, Bryansk Prince Dmitry Olgerdovich and Siversk

Prince Dmitry-Koribut Olgerdovich, testify to the active development of their own monetary affair only up to the time of the Union conclusion. But after it the money production goes down in the specified territories. It also led to the end of Rus' groshens (groshyky) minting in Lviv in the early 15th century.

When returning to the weight and monetary systems we note that in the second half of the 14th century the imported eastern element of the market provides massive influx of Juchid silver coins in the lands of the Dnieper region. Subsequently coins, with circulation got an international importance, are added: Prague groshens and Rus' half groshens (pivgrish). Respectively the local market uses a valuable silver coin as well.

Various names of monetary denominations and weighted-monetary systems, monetary calculus systems, etc. are often mentioned. However the local coin names and their image are often manifestations of the political side of numismatics. The economic component of the monetary circulation research is always concealed somewhere in depth, in the metrological properties of the coin itself, its weight and fineness. It was decided to find out common metrological data for all those coins which are shown on the slide. And that is what we have got.

Juchid coin system like almost all of these Middle Ages systems is based on earlier systems dating back to the depths of ancient Greece and Rome.

At the moment we know that it was based on a duodecimal notation and on several values by one of the major weight unit – miskal. At this time we know about 5 different weight values of miskal if they are expressed in grams (Table 3). The next two weight units of this system are habba and kirat which have become known to us due to the work of the researcher W. Hinz. For example, he cites a source (Ibn Mo'ad, also mentioned by M. Sauvare in 1884 – *Auth.*): "In Iraq ... the golden miskal consisted of 20 kirats each per 3 habbas, the dirham of silver consisted of 12 kirats each per 4 habbas..." (Xinc, 1970: 12). So we have almost all the weight units to calculate the weight of the coins such as miskal, kirat and habba. They relate among themselves in such a way 1 miskal is 24 kirats or 96 habbas. While studying the Table 4, you can see one of the miskal values equal to 4.26 grams. 1/96 of this weight i.e. habba is equal to 0,044 grams. The same weight standards completely coincide with Old Rus' names zolotnik and dolia. Since the 14th century dang which is equivalent to 1/6 of miskal and Rus' denga are coincided too. The unit "kirat" does not find its analog. The Novgorod pochka only has some similar features, but before the decision of the possible different values for zolotnik weight in Novgorod, there is no answer to this question. And the long existence of only two weight units in the silver coins of Rus' (4 zolotniks, 21 dolias) shows that precisely these two units were used in monetary affair.

The understanding of the above-mentioned things gives us the opportunity to realize that the weight standards of neighboring countries are based on a single principle scheme with norms in Juchi Ulus. In view of the possible confusion in modern attempts to understand such a system, it should be noted that it

had never considered any weight or weighting in grams. It had never expected a gradual decrease or increase in weight for the future either.

Another interesting point is the question of the name "Lithuanian groshen (lytovskii grish)" in Novgorod sources of the first half of the 14th century. We will cite the only one from the Chronicle of Novgorod. There is the following testimony in 1410, Novgorod inhabitants started trading between themselves "лопъци и гроши литовьськими [groshi litovskymi], а куны отложиша..." (Novgorodskaya pervaya letopis', 1950: 402).

Unfortunately because of the certain circumstances we almost do not know the monetary discoveries on the territory of Novgorod republic for the specified time. Therefore we can not analyze that numismatic material. But we have to note the following.

As it is known that in the Grand Duchy of Lithuania they only began to mint the real coin denominations groshen/grish or pivgrish at the end of Alexander II Yagelonchik (1492 – 1505) reign. Thus to find exactly "Lithuanian groshen" it makes sense to look for some well-known and widely distributed coin of Grand Duchy of Lithuania which would be able to claim the name of such a denomination by its weight and fineness.

In our opinion the name "Lithuanian groshen" early in the 15th century was defined as a collective image of coins which had been used in Grand Duchy of Lithuania and weighed half of Prague groshen. Taking into account that in the western part of Grand Duchy of Lithuania this nominal value did not exist, we can assume that at the turn of the 14th – 15th centuries the monetary-weight unit "Lithuanian groshen" matched the real coins: Rus' groshens (rus'kii groshyk) and Crimean dangs (Table 4).

The Crimean Ulus coinage study makes it possible for such a statement. Since the beginning of Toqtamysh Khan midst of reign (since the 90's of the 14th century) and especially after Shadi Beg Khan reform in 1402 the weight of the Crimean dang begins to differ from the weight in other centers of the Horde minting and it is clearly correlated with the weight change and a fineness of Prague groshen. Along with Rus groshens the Crimean dangs arrive on the territory of the Left-Bank Dnieper region, receive Lithuanian orders and participate in the circulation of Lithuanian southern lands throughout the 15th century.

We consider the refusal to use the "Lithuanian groshen" by Novgorod inhabitants in 1420 was caused by the fact that the existing analogue of the "Lithuanian groshen" was equal to 5 kirat (20 dolias) and prevented the calculation in the existing monetary system on the basis of altyn, zolotnik and 1/6 zolotnik's – denga.

In **conclusion** we want to note that the change in political conditions influenced mainly on the external characteristics of a specific monetary material, but its metrological indicators (weight and fineness) remained practically unchanged. The explanation lies in the main purpose of a local coin issuing. It was in

meeting the needs of the local market (for ordinary emissions) or emergency filling of the local treasury (military money, etc.). Traditional weight standards served as a pass for a coin into the money market. However the possibility of local minting was caused by the fact of certain autonomy as well as the right to coin regalia. The termination of the local coins (original or imitation) minting often meant a legal loss of economic and political independence.

BIBLIOGRAPHY

- Ельников М. Памятники периода Золотой Орды Нижнего Поднепровья: история, итоги и перспективы. *Татар археологиясе*. № 1–2 (8–9). Казан, 2001, 126–165.
- Ельников М. В. *Золотоординські часи на українських землях*. Київ: Наш час, 2008. (Сер. Невідома Україна), 192.
- Мухамадиев А. Г. *Булгаро-татарская монетная система XII–XV вв.* Москва: Наука, 1983. 164.
- Новгородская первая летопись старшего и младшего изводов*. Москва-Ленинград: Издательство Академии Наук СССР, 1950.
- Русина О. В. Україна під татарами і Литвою. *Україна крізь віки*. У 15-ти тт. / За заг. ред. В. Смолія. Київ: Альтернативи, 1998, т. 6, 320.
- Русина О. В. Татарська доба в історії України (1230–1330-ті рр.). *Україна: хронологія розвитку*. НАН України. Ін-т історії України, Київ: КРІОН, 2008, т. III. Від Батієвої навали до Люблінської унії, 11–119.
- Хинц В. *Мусульманские меры и веса с переводом в метрическую систему* (перевод с немецкого Ю. Э. Брегеля). Москва, 1970. 147.

REFERENCES

- El'nikov, 2001 – El'nikov, M. (2001). Pamyatniki perioda Zolotoj Ordy Nizhnego Podneprov'ya: istoriya, itogi i perspektivy. *Tatar arxeologiyase*, 1–2 (8–9). Kazan, 126–165. [in Russian].
- Mukhamadiev, 1983 – Muxamadiev, A. G. *Bulgaro-tatarskaya monetnaya sistema XII–XV vv.* Moskva: Nauka. [in Russian].
- Novgorodskaya pervaya letopis', 1950 – *Novgorodskaya pervaya letopis' starshego i mladshego izvodov* (1950). Moskva-Leningrad: Izdatel'stvo Akademii Nauk SSSR. [in Russian].
- Rusyna, 1998 – Rusyna, O. V. (1998). Ukraina pid tataramy i Lytvoiu. *Ukraina kriz' viky*. U 15-ty tt. Kyiv: Al'ternatyvy, 6. [in Ukrainian].
- Rusyna, 2008 – Rusyna, O. V. (2008). Tatars'ka doba v istorii Ukrainy (1230–1330 rr.). *Ukraina: khronolohiia rozvytku* (Vol. III). Kyiv: NAN Ukrainy. In-t istorii Ukrainy, 11–119. [in Ukrainian].

Xinz, 1970 – Xinz, V. (1970). *Musul'manskie mery i vesa s perevodom v metrichekuyu sistemu*. Moskva. [in Russian].

Yel'nykov, 2008 – Yel'nykov, M. V. (2008). *Zolotoordyns'ki chasy na ukrains'kykh zemliakh*. Kyiv: Nash chas (Ser. Nevidoma Ukraina). [in Ukrainian].

ILLUSTRATIONS

Map 1

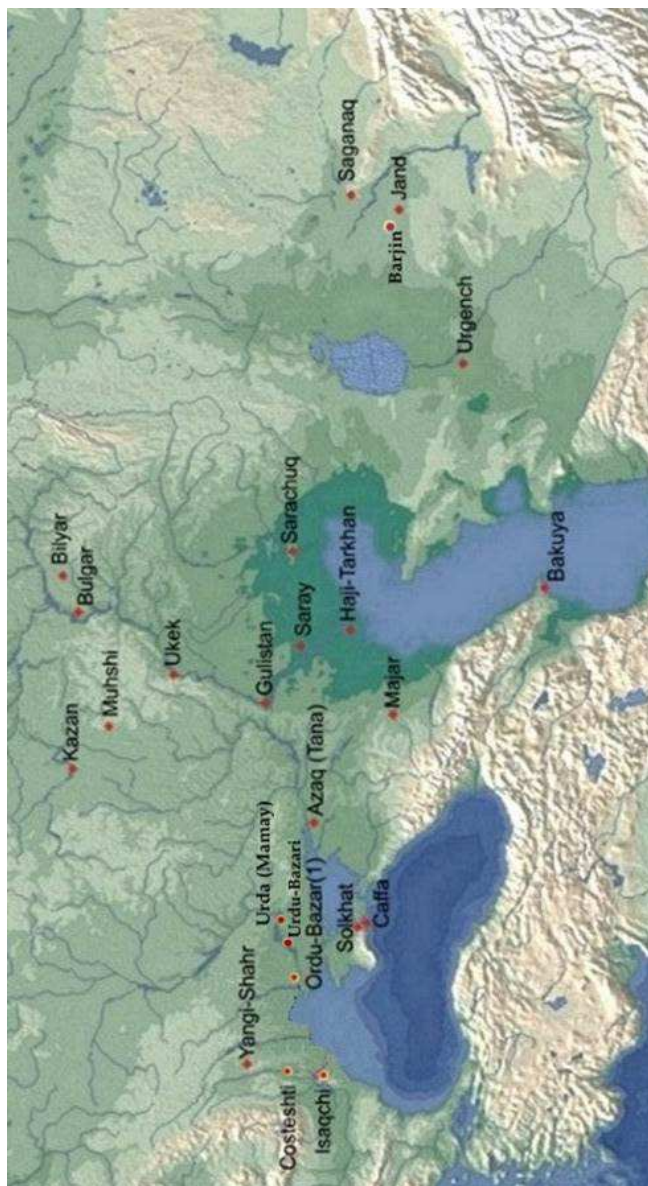


Table 1. Weight values in grams for different systems of miskal, used in Ulus Juchi's coinage (following Azgar Mukhamadiev, 1983)

proceeding time	miskal: term in scientific literature and weight		dang, max.	akche, max.	kirat	dang, Sarai	dang, Bulgar
before 1256	classic	4,26	1,42	0,712	0,178	-	-
Berke's reform 1256-1266	egyptian	4,68	1,56	0,78	0,196	-	-
1280-1310	-	4,095	1,365	0,683	0,17	-	-
Tokta's reform 1310	canonic	4,464	1,488	0,744	0,186	-	-
Uzbek's reign 1312-1341	-	4,56	1,52	0,76	0,19	1,52	-
Jani Beg's reign 1342-1357	egyptian	4,68	1,56	0,78	0,196	1,56	-
"Great Confusion" 1360-1380	-	4,56-4,095	1,52-1,365	-	0,19-0,17	1,52-1,365	-
Toqtamysh's reform	-	4,68	1,56	0,78	0,195	1,365 (7 kirats)	-
Shadibeg's reform 1408	-	4,68	1,56	0,78	0,195	1,17 (6 kirats)	0,78

Map 2. Mints on the Lithuanian-Horde borders (from South to North). **Saqchi** – the 2nd half 13th – the end of the 1st half of the 14th century; **Solkhat** – the middle of the 13th until the Horde of Girey's establishment in the middle of the 15th century; **Kaffa** – the end of the 14th until the Horde of Girey's establishment in the middle of the 15th century; **Azaq** – early 14th – 20s of the 15th century; **Costesti** – coinage by the Abdullah Khan's reign (1363 – 1370); **Yangi Shehr** – coinage by the Abdullah Khan's reign (1363 – 1370); **Balykleja** – coinage of copper imitation in the late 50's of the 14th century; **1 – nomadic camp** on the left bank of the Dniro Estuary – coinage of the copper and silver imitation of the Abdullah Khan; **2 – Ordu (Mamay's)** – coins with name of Abdullah Khan, Ghiyath al-Din Muhammad and Bulak; **3 – nomadic camp** near modern Lisichansk – copper and silver coins by the Abdallah Khan's times (1363–1370); **4 – Ordu Bazar (1)** – nomadic camp of 2nd – 3rd quarter of the 15th century; **5 – Ordu Bazari (Ordu Muazzam)** – nomadic camp of 20's of the 15th century; **Kyiv** – 1355 – 1362 – coinage of silver imitations of Jani Beg's coins, 1362 – 1394 – coinage denarius with the name of Volodymyr Olgerdovich. **Novhorod-Siverskii** – coinage by the Dmytro-Korybut's reign(1381-1392 biennium)



Table 2. Weight values by known ones of the Kievan imitations of the Jani Beg's dang and coins with Volodymyr Olgerdovich name. Values for different systems of miskal – zolotnik are colored: green – 4,26 grams; blue – 4,56 grams; orange – 4,68 grams

Weight, g	Kievan imitations of the Jani Beg's dang			Volodymyr Olgerdovich
0,78				
0,76	0,76	0,77		
0,75				
0,73	0,722			
0,712	0,712	0,71	0,702 +	
0,69	0,684	0,695		
0,67	0,672			
0,65	0,661			
0,63	0,628			
0,61				I
0,585	0,599			II
0,57	0,571	0,567		
0,55	0,540	0,556		
0,534	0,533	0,53		
0,51	0,522			
0,49				
0,47	0,486			
0,45	0,446	0,458		
0,43	0,432	0,434		

Weight, g	Kievan imitations of the Jani Beg's dang			Volodymyr Olgerdovich
0,41	0,416			
0,39				
0,38	0,378			
0,37	0,37	0,372	0,375	
0,356				
0,33				II
0,31				I
0,29	0,284	0,29		
0,27				III
0,25	0,253			
0,23				
0,21	0,203			II
0,196				
0,19	0,19			II
0,178	0,16	0,162	0,175	IV - V
0,15	0,15	0,155		IV - V
0,13				
0,11				
0,09	0,09			

Weight, g	Kievan imitations of the Jani Beg's dang			Volodymyr Olgerdovich
1,39				
1,365				
1,35				
1,33				
1,31				
1,29	1,29			
1,27				
1,246	1,245			
1,23				
1,21				
1,19	1,185			
1,17				
1,15				
1,14				
1,13				
1,11	1,105			

Weight, g	Kievan imitations of the Jani Beg's dang			Volodymyr Olgerdovich
1,09	1,084			
1,068	1,075			
1,05				
1,03				
1,01				
0,99				
0,975				
0,95	0,943	0,946		
0,93	0,924	0,931		
0,91				
0,89	0,897	0,88		
0,87	0,865	0,875		
0,85	0,848	0,85		
0,83	0,826	0,83		
0,81	0,802	0,811	0,818	
0,79	0,791	0,8		

Table 3. The number of money-weight units (kirat, pochka (?), etc.) in the different monetary systems, which consist of 4 smallest monetary units (habba, dolia ...)

24	16	8	7	6	5	4	3	2	1
miskal	dirham	dang				danik, akche			kirat
zlotnik	Prague groshen	Rus, Lithuanian groshen						Lubek denarius	pochka (?) 4 dolias Lithuanian denarius
4,095	2,73	1,365	1,195	1,025	0,855	0,683	0,51	0,34	0,17
4,26	2,84	1,42	1,246	1,068	0,89	0,712	0,534	0,356	0,178
4,464	2,976	1,488	1,302	1,116	0,93	0,744	0,558	0,372	0,186
4,56	3,04	1,52	1,33	1,14	0,95	0,76	0,57	0,38	0,19
4,68	3,12	1,56	1,365	1,17	0,975	0,78	0,585	0,39	0,196

Table 4. Values (miskal, zlotnik) for issues of weight characteristics by Kievan imitations of the Jani Beg's dang and coins of Volodymyr Olgerdovich, specified with colors.

24	16	8	7	6	5	4	3	2	1
miskal	dirham	dang				danik, akche			kirat
zlotnik	Prague groshen	Rus, Lithuanian groshen						Lubek denarius	pochka (?) 4 dolias Lithuanian denarius
4,095	2,73	1,365	1,195	1,025	0,855	0,683	0,51	0,34	0,17
4,26	2,84	1,42	1,246	1,068	0,89	0,712	0,534	0,356	0,178
4,464	2,976	1,488	1,302	1,116	0,93	0,744	0,558	0,372	0,186
4,56	3,04	1,52	1,33	1,14	0,95	0,76	0,57	0,38	0,19
4,68	3,12	1,56	1,365	1,17	0,975	0,78	0,585	0,39	0,196