

**THE EARLY STAGE OF THE WALLACHIAN COINAGE (c. 1365-1386),
IN THE LIGHT OF ATOMIC ANALYSES**

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a) Introduction:

The autonomous Wallachian issues appeared very late, not before the mid 1360s, being one of the last major European coinages. During the reign of Vladislav I (1364-c. 1377), the country adopted a Western European type monometallic monetary system, based on silver. The metrological model of the first Wallachian *ducats* was represented by the light-weight “Balkan” version of the Venetian silver “*grosso*” (in fact, *aspers*), used in Bulgaria during the mid 14th century (**Fig. 19a-b**) (Iliescu 1970, p. 14-9; Metcalf 1979, p. 326-331; Stancu 1997, p. 183-99). Quite likely, the metrological models of the first Wallachian *bani* were the Hungarian royal “*denari banales*”, introduced after the monetary reform of Charles Robert of Anjou, in 1323. Though bearing, sometimes, Cyrillic inscriptions, the monetary designs of the Wallachian issues were purely Western ones, being ultimately inspired from those used on the reverse of some types Hungarian *groats* of Louis I, struck during 1346-51 (Moisil 1924, p. 26-29; Cernovodeanu 1982, p.891-903; Huszár 1979, nos 520-521).

In spite of commonly-held views, the early Wallachian monetary system did not consisted of three denominations: the *ducat*, *dinar* and *ban* (pl. *bani*) (Moisil 1924, p. 20-34; Iliescu 1956, p. 299-304; Iliescu 1970, p. 15; MBR 7-18; Iliescu 1983-1985, p. 279), but only of two; namely, the *ducat* and the *ban*. In fact,

the so-called *dinars* were only light-weight, debased *ducats*, struck after the monetary reform undertaken during the mid 1370s. So far, the relation between the *ducat* and *ban* is not too clear. Modern Romanian scholars considered that the *ban* was worth $\frac{1}{2}$ or $\frac{2}{3}$ of a *ducat*, however, modern metrological research shows that they represented, more likely, only $\frac{1}{3}$ of a *ducat* during 1365-86.

b) Investigations on the composition of Romanian medieval coins:

Compared to Balkan and Central European standards, the first investigations on the metallic composition of the Wallachian coins were made public very late, only in 1960; moreover, they were performed not by numismatists, but by an archaeologist, specialised in the Neolithic cultures. C. N. Mateescu had published the results of spectrographic analyses of three pre-reformed issues of Mircea the Elder (1386-1402) (Mateescu 1960, p. 279-86), but the results of his investigations were, basically, ignored by the numismatists, until 1980s-1990s. In 1990, C. Știrbu and C. Beda published a new set of data regarding the silver content of the Wallachian issues of Vladislav I. This information was based on touch-stone measurements (Știrbu and Beda 1990, p. 106-50).

During the early 1980s, a systematic investigation of the alloy composition of the Romanian medieval coinage was initiated by several teams of physicists from the National Institute of Nuclear Physics and Engineering “Horia Hulubei” - Bucharest, Măgurele and numismatists from the National history Museum of Romania. The initial research focused on the late 14th and early 15th century Wallachian coinage (Știrbu and Stancu 1982, p. 57-93). After 1996, the programme of investigations gained a new impetus. New topics were added, such as the evolution of the 14th-17th Moldavian coinage, as well as the 15th century Wallachian coinage, domains which were previously neglected. The new approach

had also taken into consideration the investigation of the evolution of alloy contents of the coinages from neighbouring countries: Hungary, Bulgaria, Serbia, Poland, Lithuania, Bohemia, the Golden Horde and the Ottoman Empire, which have had a quite strong influence on the development of the Romanian medieval coinage. In 2002-3, a batch of Romanian medieval coins, kept in the collection of Fitzwilliam Museum collections in Cambridge, was investigated by a team of French researchers, lead by J.-N. Barrandon, from the Orleans Research Unit of CNRS (unpublished so far).

Since 2005, within the framework of ARCHAOMET and ROMARCHAOMET programmes, financed through grants from the Romanian Ministry of National Education and Innovation, a joint team of numismatists and physicists performed XRF analyses on more than 1,000 medieval coins.

In 2005, when we started our investigations on the early Wallachian coinage, only 13 coins were already analysed through atomic and nuclear methods (Vladislav I – 5 sp.; Radu I and Vladislav – 1 sp.; Radu I – 5 sp.; Dan I – 2 sp.) and only a set of schematic (and misleading) metrological data was available. According to the common wisdom at that time, the coinage of each reign was regarded as a very static phenomenon. In spite of the obvious change of designs and average weights highlighted by the issues, no one had taken into consideration, even at the basic level of preliminary suppositions, the possibility that these changes were the consequence of several reforms.

The recent metrological and alloy content analyses proved that during the reign of Vladislav I, the Wallachian mints seem to have changed several times the weight standards of the *ducats* (**Fig. 7-10a-b**): MBR 1-3 = 1.11g; MBR 4 = 1.11g; MBR 5 = 1.07g; MBR 6-8 = 1.07g; MBR 9-14, 16 = 0.83g; MBR 17-20, 22 = 0.83g; MBR 21 = 0.73g; MBR 24-5 = 0.68g; MBR 26-7 = 0.68g and 0.32g, for the *bani* –

MBR 30-2 (**Fig. 1**). In spite of a certain variability of the silver contents so far measured for the *ducats* of Vladislav I: MBR 1-3 = 919‰; MBR 4 = 907‰; MBR 5 = 921‰; MBR 9-14, 16 = 924.75‰; MBR 17-20, 22 = 930.25‰; MBR 21 = 927‰; MBR 24-5 = 903.33‰, the figures seem to assert the conclusion that the theoretical legal standard of the fineness was c. 930‰ (22.50 carats, or 15 lots) (**Fig. 2**). Quite likely, the early Wallachian mint adopted the standard of the Central-European *groats* of Prague (937‰), which was equal to almost “pure silver”, according to the perception of contemporary people.

The analyses had shown that this standard was observed until the last years of Vladislav I reign, when it dropped to $\approx 900\text{‰}$ (21 $\frac{2}{3}$ carats or 14 $\frac{2}{5}$ lots).

It seems that the Wallachian petty coins – the *bani* (**Fig. 11a-b**) were struck according to a lower fineness standard of only 883.5‰ (21 $\frac{1}{5}$ carats or ca 14 $\frac{1}{10}$ lots) (**Fig. 2**), to cover the higher production and distribution costs specific to lower denominations.

All the coins of Vladislav I analysed so far contain also quite an important proportion of gold (up-to 10-15‰ $\approx 1/4$ ct.), an amount which was below the detection limit of the measurement technologies available in the Wallachian mints and for this reason, quite likely, the gold was accounted as “silver” in the contemporary fineness estimations. Most of the coins contain also bismuth as trace element.

In most cases, the striking changes in the weight standards of the *ducats* of Vladislav I correspond to the introduction of new monetary designs. Quite likely, one could suppose that these alterations of the old patterns were the consequences of monetary reforms.

The first one took place c. 1369-71, along with the introduction of a new monetary design – the *cross-fleury* (MBR 5-7) (**Fig. 8a-b**). The first reformed coin type presents a slightly reduced weight, but the fineness was the same as previously (c. 930‰).

Soon after, during the early 1370s, a new type of *ducat* was introduced (MBR 9-16, with Latin inscriptions and MBR 18-25, with Cyrillic inscriptions) (**Fig. 9-10a-b**). Their average weight was c. 0.83g and the silver content of c. 930‰.

Before 1375, a further reduction of the weight standard took place, with the introduction of a lighter *ducat* (MBR 26-29), weighting about 0.70g. Unlike the previous periods, the severe weight reduction was followed also by an important reduction of the silver content amounting to c. 900‰. However, so far it is quite difficult to assert if these obvious alterations were or not the result of a new monetary reform, because the external aspect of the issues did not suffer major changes.

In light of recent metrological and fineness investigations, the coinage struck in the name of Radu I (c. 1377-83) (**Fig. 12-16a-b**) is revealed to have even a more complicated evolution than that of his predecessor. The main groups of *ducats* of Radu I have the following average weights: MBR 40-3 = 1.04g; MBR 64-5 = 0.63g; MBR 66-71 = 0.61g; MBR 51, 58-63 = 0.57g; MBR 72-6a = 0.57g; MBR 44-50, 52-7 = 0.56g. Regarding the small change – the *bani* of Radu I, the analyses proved that they belong to two different groups: the “silver” issues – MBR 77, having an average weight of 0.26g and the “pure copper” issues – MBR 78a-b – of 0.50g (**Fig. 3**).

The measured silver contents of the *ducats* of Radu I are the following: MBR 40-3 = 915.61‰; MBR 66-71 = 915.61‰; MBR 72-76a = 907.91‰; MBR 44-50, 52-7 = 862.39‰ and MBR 51, 58-63 = 842.5‰ (**Fig. 4**).

The MBR 78a-b type of *bani*, asserted to be of Radu I, were struck in “pure” copper – Cu = 996.5‰. If this attribution will be proved to be correct by more evidence (most of the finds of such coins are reported from North-Western Bulgaria and Serbia), they should be considered the only so far known Wallachian copper coinage from the 14th-15th century.

The distribution of silver content of the *ducats* of Radu I proves that the *cross-fleury* issues of this ruler (MBR 40-3) (**Fig. 12a-b**) were struck before 1377, in fact, during the early 1370s, during his joint reign with Vladislav I. The same could be the situation for his issues bearing on the obverse the Slavonic inscription **ВЄЛННКЪ ВОЄВОДА** (Grand Duke) (MBR 66-71) (**Fig. 13a-b**). Both groups of issues were struck from a silver alloy of c. 916‰ (22 carats or c. 14 2/3 lots), which was no more in use at the end of the reign of Vladislav I (c. 1375-7), when the fineness had dropped to c. 900‰.

A new monetary design, also associated with a rather high silver content of c. 900‰, reveals that another reformation of the Wallachian coinage happened during the early years of Radu's I sole reign (soon after 1377). The newly reformed issues of Radu I are the *ducats* bearing a peculiar monetary design, representing on the reverse the prince clad in knight's armour and holding a spear and shield (MBR 72-6a) (**Fig. 14a-b**).

During the late 1370s and early 1380s, the weight of the Wallachian *ducats* was gradually reduced to c. 0.60g and the silver content to c. 840‰ (20 1/5 carats or c. 13 1/2 lots). However, because of the lack of obvious changes in the pattern of the traditional Wallachian monetary design, it is difficult to connect the

lighter ducats of Radu I to any clear attempt of monetary reform/s. It seems more likely that this reduction was the result of an organic evolution, a continuation of a trend already started during the reign of Vladislav I.

The analyses of the ducats of Radu I reveal the presence in the monetary alloy of a certain amount of gold and, sometimes, even bismuth.

As the metrological and fineness investigations have proved, the evolution of the Wallachian coinage was not too even during the short reign of Dan I (1383-6). The *ducats* of this ruler (**Fig. 17a-b**) have the following average weights: MBR 86-7 – 0.51g; MBR 86-7 – 0.51g; MBR 79 – 0.47g; MBR 80-3 – 0.45g; MBR 84 – 0.44g; MBR 84 – 0.41g. The *bani* asserted to the Dan I reign (though this attribution is not sure) (**Fig. 18a-b**) – MBR 88 have an average weight of 0.18g (**Fig. 5**).

The analyses have yielded the following average parameters of the fineness of Dan I *ducats*: MBR 86-7 – 801.7‰; MBR 80-3 – 776‰. The only *ducat* belonging to the variant MBR 84 so far analysed had an extremely high silver content of 921.25‰, but the figure is not statistically relevant. Similar results were obtained for the only *ban* asserted to Dan's I reign so far investigated: 856‰ (**Fig. 6**).

Quite likely, at the beginning of Dan I reign, the legal standard of the Wallachian *ducat* was about 0.50g and its silver content of c. 800‰ (19 1/5 carats or 12 4/5 lots). However, a final reductions took place during this rule, which led to an average weight of the *ducats* of c. 0.40g and a fineness of c. 775‰ (c. 18.2/3 carats or 12 2/5 lots).

In most cases, the analyses of Dan's I *ducats* have shown the presence of traces of gold in the monetary alloy, though in a smaller amount than before,

because the rapid recycling of the older stocks and the massive addition of copper.

c) Conclusions:

During the first 20 years of autonomous coinage, the Wallachian *ducat* lost about 64% of its initial legal weight and roughly 17% of its previous silver content. However, the hoard evidence as well as the coin dies study prove that the continuous reformation of the Wallachian coinage during the 1360s-early 1380s was followed by an impressive and rapid increase of the amount of the issues. It could be estimated as following:

- c. 1370-7 - **x300%(1365-70 = 100%)**
- c.1377-83 - **x500%. (1365-70 = 100%)**
- 1383-6 - **x1000% (1365-70 = 100%)**

Until the mid 1380s, there seems to be a perfect concordance between the evolution of the monetary weight-standards used in Wallachia and Bulgaria (and probably, in Serbia and Byzantium). However, it is also possible that some reductions of the weight-standards which happened during the late reign of Radu I and during Dan's I rule were the echoes of the metrological evolutions of the Hungarian *deniers*, during the last part of Louis I and early years of Maria reigns.

Quite likely, the reasons for the sharp decline of the average weights and of the silver content of the Wallachian coinage during 1360s-early 1380s can be found not only in the peculiar economic and political situation of the country, but also in the general trends in contemporary European coinages.

Because Wallachia had no domestic silver resources, the only available source of the precious metal used for minting was recycled foreign coins, ingots as well as melting, during emergency situations, of secular and church silverware and the jewellery. Even most of the copper needed to sustain the minting

activities was imported. In spite of this disadvantage, Wallachia had rich economic resources, relevant for international trade: salt, cattle and cattle-breeding products, honey, wine and wax, which, under normal circumstances, could provide not only the needed precious metal for minting, but even notable surpluses for the local silverware and jewellery consumptions. However, the unstable domestic and international political situation in the region during the late 14th century, often made the long term stability of silver imports quite questionable. On the other hand, Wallachia was confronted, almost permanently, with excessive military expenses required by frequent civil wars, as well as by an active international policy. So, no wonder that these specific developments in the domestic and international policy of the country posed serious threats on the monetary stability in Wallachia during the entire 14th-15th century.

One could also suppose that the Wallachian monetary market suffered during the 1360s-1380s, in a certain way, the effects of the general European silver shortage, already visible in the Balkans during the second half of 14th century (Metcalf 1979, p. 297-326).

Analyses have revealed that the entire silver used by the early Wallachian mints was of foreign origin. Most of the Wallachian coins struck during 1360s-1380s contain a certain amount of gold and bismuth. Probably, the main source of metal used in Wallachia was provided by the recycling of the Bulgarian *aspers* struck by John Alexander and Michael Asen and John Strachimir (which always contain gold and bismuth as trace elements), though one could take in consideration the use of a certain amount of Serbian, Hungarian and even Western silver.

The new series of analyses have provided a completely renewed perspective regarding the dynamic evolution of the Wallachian monetary system

during the reigns of Vladislav I, Radu I and Dan I. They have shown that in about 20 years, the Wallachian coinage was reformed at least four times (at the beginnings and during the mid 1370s, soon after 1377 and, the last time, during 1383-6). Each reform led to the introduction of a more debased and lighter weight type of *ducat*, but it was followed also by an important increase of the amount of the coinage needed by the expanding political payments and the economic development.

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Notes

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