

HERPETOLOGICAL GATHERINGS I

THE BAD MARRIAGE OF MITHRIDATES EUPATOR

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Contents: Mithridates - Andromachus - Theriak salts - Gouvernement - Literature - Appendix A - Appendix B - Appendix C.

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MITHRIDATES

King Mithridates VI Eupator (132-63 BC) presumably had a bad marriage. That is to be concluded from the fact that his sister Laodike who was also his wife had undertaken an (idle) attempt to poison her tyrannical husband. A nice indication is also the fact that after that attempt Mithridates had her executed without any scruples. In ancient times wedding problems were obviously solved in an easy way (Pauly, 1979, page 1356).

Whether it has been this experience that stimulated Mithridates to make a comprehensive study of the properties of all kinds of poisons and - much more important - how to neutralize them is in a historical point of view an unsolved problem. For in those days, it was a good use indeed to eliminate (political) opponents with poison: *Not in an earthen pot but in a jewelled chalice will you find poison*, said the Roman poet Juvenal early in the second century of our era. It is however evident that Mithridates has suffered for a great fear of being poisoned. For he had minimalized the opportunity to be poisoned with very great efforts.

Pontus, Mithridates' kingdom had in his days a very rich flora. So Mithridates was enabled to make very intense study of the toxicological properties of the most divergent herbs. Although he battled the Romans almost permanently he had taken his chances to have ample scientific connections with famous Roman physicians like Asclepiades. From other lands he received from research workers a lot of valuable information too.

For example: Zephyrus, a physician who worked in Alexandria, once sent him an antidote against poisons and against the bites of venomous snakes. With this antidote he sent a man who was condemned to death on whom Mithridates - *O tempora, O mores* - might try it out, giving it either in advance or afterwards. The condemned man was in luck because Zephyrus' antidote was very effective and the man stayed alive for that moment. Zephyrus' antidote contained 21 herbs and no minerals or animal ingredients.

Mithridates continued his empirical investigations with conviction. He had his slaves bitten by spiders, scorpions and snakes and studied at his ease the symptoms and developments of the poisoning (Engel, 1972, pag. 25). There are indications that tyrans exchanged toxicological and antidotal data with each other (Watson, 1966, pag. 24).

Mithridates was mainly occupied with the investigation of simplicia. Thus he discovered active remedies against the bites of venomous snakes, venomous spiders and scorpions. At the end he got the idea to prepare a complex antidote. He developed a cocktail of herbs (see Appendix A) and he daily took a small dose of it, together with duck blood. Duck blood was believed to cause immunity against poisons and venoms (Sarton, 1959, page 403 - Appendix B). Such a cocktail is called after him a mithridatium. The daily intake

of it in growing doses immunized the user after a while from the most current poisons and at the same time it was effective against all kinds of ailments.

It is very ironic that Mithridates with the help of the mithridaticum principle has been able to moderate his fear for being poisoned, but at the same time he has become a victim of it: the great Roman general Pompeius succeeded in 66 BC in terminating the series of victories of Mithridates. In the end the loser was abandoned by everyone and was besieged by his own son in his fort Panticapaion having no way to escape. I give the raciest version of his end: totally desperated he poisoned his wives, concubines and daughters. When the attempts to poison himself failed, he ordered a celtic soldier to pierce him.

Some times later Pompeius found in the palace of the besieged Mithridates a notebook. In the king's handwriting were written all kinds of prescriptions for antidotes against poisons. Thus Rome has got the knowledge of Mithridates' toxicological and antidotal heritage.

By the way: in Egypt it was the very ambitious Cleopatra (born 69 BC) who had also a great fear for being poisoned by her opponents. She had immunized herself too. And just as it was the case with Mithridates she came to a point she loved to be death. Although she knew the poisoned cup would stay without efficacy, she drunk it and of course she did not die at all. That is why she took a cobra (*Naja haje*, a snake usually used for executions in that time), forced that snake to pierce her breasts and died afterwards.

ANDROMACHE

About a century later there have not been any changes in the way dignitaries tried to eliminate their opponents. And still Rome knew emperors who were afflicted with a great fear for being poisoned. Nero (37-68 AD) was such an emperor. His biography gives us some nice examples of the manners of dignitaries of that time to potential rivals (f.e. Walter, 1960; also Sarton, 1959, page 136). That is why he assured himself of the help of Andromache, a famous physician who had a great knowledge of herbs.

This physician got from Nero order to compose a mithridatium that was, if possible, still more efficacious than the one of Mithridates. Andromache eliminated from the original mithridatium some ingredients he thought to be less effective and added some others. He increased the quantity of opium and - and now it gets really interesting for herpetologists - he added as a new ingredient viper meat.

Presumably this last addition rested on the principle of nowadays homoeopathy: *similia similibus curantur*, the same is cured by the same. Schouten suggests that the idea of the activity of the viper meat probably has been based on magic consideration than on empiric investigations.

Andromache had chosen for the viper, considering the earlier believe that the viper was the less venomous of all snakes (Topsell, 1608, page 305). He called his cocktail *Antidotum mithridaticum* and honored it with the epitheton ornans *galene*, which means 'giving tranquillity'. Andromache had expanded the number of ingredients to 64 in stead of the 54 of Mithridates.

For centuries it has been a real panacea against poisons and venoms (nota bene: poison: herbal, venom: bestial). It was written out as a prescription against the plague, but furtheron it cured almost everything: chronic headache, hardness of hearing, dimness of sight, shortness of breath, spitting of blood, epilepsy, liver trouble etc. (Watson, 1966, page 46).

Preparing *Antidotum mithridaticum* demanded the utmost care and vigilance. Only the best ingredients had to be used and the quantities concerned were imperative. On

account of the quantities Plinius would exclaim: *Which of the gods, in the name of Truth, fixed these absurd proportions? No human brain could have been sharp enough* (Plinius, XXIX, viii, 24-25). To avoid misunderstandings the quantities concerning, Androchamus wrote his recipes in Greek verse. The metrical form not only aided the memory but was in some measure a safeguard against fraudulent alterations (Watson, 1066, page 7).

Imperative prescriptions were especially in force for such an important ingredient like the viper meat. Thus the female animals only had to be caught at the end of spring or in the early summer. In that time, the venom of the snakes would not be very efficacious. Preferably those snakes had to be used, that had their habitat in the neighbourhood of the sea or in salt-marshes.

First of all the head had to be cut off, then the tail. Both parts were namely very harmful (Topsell, 1608, page 305). The bigger the viper, the larger the parts that had to be cut off; then the snake had to be skinned, the inwards had to be taken out and cooked over a smokeless fire until the flesh came away from the bones; the flesh had to be pounded and at last very dry bread of the best quality had to be added; the physician had to macerate everything until it was all grounded down, then it could be made into pastils. And those pastils were the indispensable ingredient in the *Antidotum mithridaticum*.

Preparing the theriak, some herbs were added to overcome by their fragrance and flavour the harshness of other components, this being a precursor of really gilding the pill! (Theriak was the name of the antidote Watson used for the cocktail mainly to cure the bites of venomous animals like snakes, scorpions, spiders etc.)

It took a lot of time to prepare this panacea: almost two months, at least 40 days (a 'quarantine'). After that period the theriak started to mature, a process that was stimulated by adding cinnamon. Twelve years was the proper period. But those who wanted it strong, took it when five or seven years old. Even after 30 years the theriak was still serviceable. In any case, after 50 years it had lost its virtue (Watson, 1966, page 49-50).

Not only the viper, but also another kind of snake was used as an ingredient for theriak. It is the snake that is called *tyre* by Topsell and gets from Maerlant the name *tisus* (Topsell, 1608, page 280; Maerlant VI, vss 779-806). According to the first mentioned bestiary author the tyre is to be identified by the *dipsas*. And the *dipsas* is probably to identify with *Cerastes vipera* (Van der Voort, 1992). Ancient authors do declare there are no external differences between the viper and the dipsas. The only difference is that of habitat: the dipsas presumably liked salt areas (that is why her stroke caused dipsomania), as the viper preferred dry places. Topsell states precisely that Libya was a country in which many dipsades occurred, because there were many salt-marshes. Thus it becomes obvious why this snake is so rare in Italy. I have spoken earlier about the preference for snakes living in a salty habitat as an ingredient for the preparing of theriak. The antidotal pastils made of the *tyrus* were called *trochiscos tyri* (Van der Voort, 1992).

According to Schouten *Vipera redii* was supposed to be a very suitable viper species (Schouten, 1963, page 93). Grzimek and Trutnau however, do not mention this snake species (Grzimek, 1973, Trutnau, 1982). Probably is meant *Vipera raddei*. But Schouten states positively that the so called *Vipera redii* knew a wide spread habitat in Italy, which information is not confirmed by Trutnau (Trutnau, 1982, page 127).

THERIAC SALTS

Because of the long maturing period of theriak it is no wonder scientists looked for an alternative that would not take so much time. The Roman physician Galen described how it was made. And again snakes were an indispensable part in it.

It was prepared in the following way: get four vipers, catch them all at the same time and keep them for at most two days. Take of white common salt one modius (about a gallon). Add nine specified herbs in specified quantities and mix with Attic wine. Put one-half of the mixture into a new clay pot. Then put in the live vipers and five fresh squills cut down small, and add the other half. Cover the pot carefully with clay, but leave four openings to let out the steam or vapour. Set the pot on a fire. When the vapour comes out dark and turbid, you will know that the heat has reached the vipers; when it ceases, all is thoroughly cooked. Move the pot to a place where it will cool, and leave it for a day and a night. Then take out the roasted matter, add herbs and pound it; pound it again and again until everything has reduced to powder. After ten days the salts are ready for usage. They are less strong than *Antidotum mithridaticum* (Watson, 1966, page 51).

GOVERNEMENT

In Italy it was the harbour Venice which had applied in particularity to the trade with the East. It was in Venice, where the market was for precious exotic herbs which were necessary for the preparation of theriak. As snakes were an indispensable ingredient, the chemists applied snake collections, to be able to dispose at any time for this ingredient. Their *trochisci de viperis* were of such a quality that they were only delivered with a certificate (Bosman-Jelgersma, 1983, page 107).

There was a need to do so, because the supply of the necessary ingredients was very irregular and it was possible that chemists during periods of scarcity came into temptation to use ingredients of non optimum quality. Apart from cases of force majeure, in those days it was also very alluring to use less precious substitutes.

Venice was, however, not only the harbour where trade came into Europe, but also the place where the most horrible and infectious diseases entered the continent, imported by sailors from remote countries: the black death (the plague) took the lives of one third of the whole population between India and Iceland in the periode 1348-1350! (Tuchmann, 1980, page 9, Dutch edition). Because one believed to be able to counter-attack the plague, which started a victorious march through Europe, with *Antidotum mithridaticum*, the government kept an eye on the preparation of the only remedy in cases of epidemics. And the people wanted to be convinced of the fact that in cases of medical disasters it could rely on the theriak. Besides the rich people often took theriak profilactic.

To avoid evil practices as much as possible, many municipalities ordered that theriak only was to be prepared under public inspection. Schouten gives a regulation from 1593:

Ende daeromme en sal niemandt eene apotheke moghen opstellen dan een apothecar, die in een goede vermaerde apotheke gheleert heeft. En sal oock gheen apothecar moghen maeken theriam Andromachi, oft Magnam theriacam Galeni, oft Mithridatium, 't en sij den apothecaris alle de simplicia in haere gewichte stellen bij orden, om die speciaelijck noch eens van de medicijns der voorsz. steden gevisiteerd te worden, opdat gheen faute daerinne en sij (Schouten, 1963?, page 93 - see Appendix C for a translation).

Inevitable some simplifications took place in the pretentious theriak recipe. This concerns the quantities as well as the substitutes of it. Snake lovers will be very pleased to hear that the viper meat in Holland for instance was changed against hedge-hog meat which will be regretted by hedge-hog lovers. Of the almost 70 ingredients of *Antidotum mithridaticum* there were only 19 left in Leeuwarden (a place in the northern of Holland) in 1712; in 1795 a theriak is known, consisting of 4 ingredients. The *Theriaca diatesseron* of 1758 was still sold in the 20th century in Bodegraven (also a place in Holland), especially to farmers for their cattle. In Germany, theriak was still mentioned on the list of medicines, till it was removed from that list in 1882 after investigations had pointed out that this remedy was completely worthless (Zimniok, 1984, page 146).

N.B.: This article is Appendix E in the study mentioned in the bibliography (Van der Voort, 1993).

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APPENDIX A

(see page 106)

Watson gives an example of a mithridatium with which poisonings could be neutralized. This variation is supposed to be developed by Mithridates and is handed down by Cornelis Celsus (1st century AD, a very famous physician who wrote a lot of important medical-scientific studies - Watson, 1966, page 5).

Not all the ingredients are clear to me. Although Watson gives the herbs in English, a lot of them stay unknown to me. These herbs are printed in italics. I am very pleased to be informed about them. The classification principle is the weight of the parts.

1-66 grammes:

* *costmary*

20 grammes:

* *sweet flag*

24 grammes:

* *malabathrum*
(leaves)

8 grammes:

* *hypericum*
* *gum*
* *saxapenum*
* *acacia juice*
* *Illyrian iris*
* *cardamom*

12 grammes:

* *anise*

16 grammes:

* *Gallic nardus*
* *gentian root*
* *dried rose leaves*

17 grammes:

* *poppy tears*
* *parsley*

20-66 grammes:

* *casia*
* *saxifrage*
* *darnel*
* *long pepper*

21 grammes:

* *styrax*

24 grammes:

* *castoreum*
* *frankincense*
* *hypocistis juice*
* *myrrh*
* *opoponax*

24-66 grammes:

* *flowers of round rush*
* *turpentine resin*
* *galbanum*
* *Cretan carrot seeds*

25 grammes:

* *nard*
* *opobalsam*
* *shepherd's purse*

28 grammes:

* *rhubarb root*

29 grammes:

* *saffron*
* *ginger*
* *cinnamon*

The weight of this concoction has been estimated at about 3 lbs. At a dose a day, it would serve for six months. Differences in quantities are sometimes so slight as to provoke a doubt whether they had any real significance, and indeed whether the ancients possessed scales which could measure so nicely.

APPENDIX B

(See page 106)

Herbs being a part of the family of the *Solanaceae* are very poisonous. Mithridates has well observed that ducks and birds ate these dangerous herbs. He concluded from that they were immune to these poisons. In a sense they are indeed, but he took the wrong conclusion that these animals could pass their immunity on people with their blood (Engel, 1974, page 27).

APPENDIX C

Translation from the Middle-Dutch of the regulation from 1593 (see page 109):

That is why nobody is allowed to prepare a medicine but a chemist who has got his education in a good, famous dispensary. There is no chemist allowed to prepare theriam Andromachi, or Magnam theriacam Galeni, or Mithridatium, unless the chemist has the weights of the simplicia checked exactly and he will be controlled by the chemists of the town in order that there will be no mistakes in it.



A chemist preparing vipers for mithridatium. From Van Dijk, 1982, page 198.