

# *Cynomorium coccineum* Linnaeus

## 17-19<sup>th</sup> Century *Materia Medica* Melitensis

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### Summary

The search for possible effective therapeutic agents in the 17th century led to the discovery of *Fungus Melitensis*. This parasitic flowering plant was initially believed to grow only on a small islet off Gozo known variably as General's or Fungus Rock. First mentioned by the Maltese historian Gian Francisco Abela in 1647, the plant was described and illustrated by the botanist Paulo Boccone from Palermo in 1674. A detailed clinical treatise was prepared by the Maltese physician Gio Francesco Bonamico in 1689. Basing the rationale of therapeutic properties on the "doctrine of signatures", the *Fungus Melitensis* was considered useful by virtue of its colour in conditions involving blood [particularly for dysentery]; while on the basis of its phallic appearance it was considered efficacious for venereal disease. The plant gained increasing popularity and started being exported overseas to Europe. The increasing demand on this restricted plant led to concern on its possible extinction and legislative measures were enforced whereby its gathering was reserved for the Grandmaster. The sides of General's Rock were also made smooth to make access to the rock difficult. The plant lost its medicinal reputation during the early decades of the nineteenth century. The plant has now been relegated to the annals of medical history and folklore, though it is now designated a protected species.

Sixteenth century prescription lists from *Santo Spirito* Hospital at Rabat in Malta confirm that pharmaceutical practice during the Early Modern Period was very much in the mainstream of the Arabo-Hellenic medical tradition that flourished on the continent at the time. The *materia medica* lists shows an overwhelming majority of vegetable source material, many of which were available locally in the Maltese Islands, though some required importation from overseas probably from Sicily. Substances derived from the animal and chemical kingdoms were also utilised<sup>1</sup>. Throughout the subsequent centuries very little improvement appears to have been made in the development of effective pharmaceuticals in spite of a continuous search for possible useful agents. Pharmaceutical practice at the end of the 18<sup>th</sup> century (1769) remained similar to that in the earlier centuries, though some of the previously listed items had been identified as useless and possibly harmful<sup>2</sup>. The search for possible effective therapeutic agents led to the discovery of *Fungus Melitensis* in the seventeenth century - a plant that was reputed to have widespread pharmaceutical properties. The plant, known as *Tarthuth*, grows in the Middle East and was reputed with medicinal properties by several medieval Islamic physicians including Al-Kindi [800-870 AD], Al-Razi [865-925], Ibn Masawayh [777-857], and

Maimonides [1135-1204]<sup>3</sup>.

*Fungus Melitensis* [maltese: *gherq sinjur* or *gherq il-general*] is a rare parasitic flowering plant with a very restricted distribution. It was initially believed to grow only on a small islet off Gozo known variably as General's or Fungus Rock<sup>4</sup>; but it has now been shown to grow throughout the Mediterranean, Irano-Turanian and Macaronesian regions<sup>5</sup>. Devoid of chlorophyll, this parasitic plant is dark red in colour. It generally sprouts from a thick tuberous rhizome growing to a height of about seven inches. When cut, the rhizome and plant yield a mucilaginous bitter tasting juice that turns a brilliant red colour. This parasitic plant was first mentioned by the Maltese historian Gian Francisco Abela in 1647 who wrote "Cala ta' Dueyra, di rimpetto si mira un scoglio nomato Hagira tal Gernal, bagnato intorno, intorno, dal mare nel piano, e rialto di cui si genera un' herba che tira al vermiglio, non dissimile nel di fuori, & in quanto alla forma a` I finocchi marini, questa diseccata e ridotta in minutissima poluere, e poscia data a` bere, gioua mirabilmente alla dissenteria, si come per molte sperienze, ne siamo certificati, ne si raccoglie in altra parte per tutto questo dominio"<sup>6</sup>.

In 1674, the botanist Paulo Boccone from Palermo described and illustrated the plant, named *Fucus Zypoides coccineus tuberosus melitensis*, in his botanical work *Icones et descriptiones rariorum plantarum. Siciliae, Melitae, Galliae, & Italiae* and in his *Museo di fisica*. He observed that when cut into thin slices and exposed to sunlight or covered with paper, its colour changes from white to red. This colour change was believed to result from the heat of the sun or the nitrogen in the air. When squashed, its juices are coloured blood red. The flesh of the plant tastes rather bitter and leaves the tongue and mouth corrugated and contracted. It was considered to cause constipation<sup>7</sup>. In 1759 it was scientifically designated in the binomial system as *Cynomorium coccineum* by Carl Linnaeus in his *Amoenitates Academicae*. In his work, Linnaeus included a treatise on *Fungus melitensis* prepared by Johanne Pfeiffer in 1755. The plant was considered an excellent remedy for drying up ulcers, strengthening gums and stopping uterine bleeding<sup>8</sup>.

The Maltese physician Gio Francesco Bonamico in 1689 wrote a treatise entitled *Fucus Spicatus Coccineus Melitensis, Planyta singularis. Accessit Plantarum quae in Melita & Gaulo Insulis observantur, brevis Notitia* wherein he described the plant and its medicinal uses<sup>9</sup>. Bonamico reported that "sed neque in ullo alio Europae, imo nequidem Asiae littore, quantum saltem hactenus humana potuit diligentia comperi. Nam non modo nemo et tot insignibus Bottonographis qui utriusque contentis oras curiose perlustrarunt, nascentesque inibi plantas editis voluminibus sedulo descripserunt, similem ullam se observasse commemorat, sed et perenni vir dignus memoria Petrus Castellus cum omnium medicinae partium tum speciatim Botanicae, dum



viverit, peritissimus atque ejusdem in celebri Messanensium schola Professor, oblatam hanc sibi forte plantam ante annos aliquot a Melitensi medico prorsus sibi incompetam novamque fassus est ac nostrati huic scopulo peculiarem sic credere pronuntiavit”<sup>10</sup>. He further attributed medicinal properties stating that “Unde aegros facilius citiusque quam ullo alio remedio sanitati restitui constantissime asseverant”<sup>11</sup>. The plant was prepared by oven-baking in a well-stoppered earthenware vessel. It was then powdered, and administered mixed with honey or as a wine infusion. It was allegedly useful for apoplexy and dysentery. The plant extract was noted to stain the skin and could also be used to dye cloth. The staining properties of the plant led Bonamico to believe that “tutte le lucertuole che vi si trovano di color vemiglio e d’una smisurata grandezza li quali vanno succiandu letti frutti agupuisa di tanti api.” The General’s Rock Wall Lizard is now known to be a separate subspecies designated *Podarcis filfolensis generalensis* that is different from the mainland subspecies by the degree of melanism and more vivid colours<sup>12</sup>.

Basing the rationale of therapeutic properties on the “doctrine of signatures” whereby the characteristics and appearance of the plant were linked to a particular medical condition, the *Fungus Melitensis* was considered useful by virtue of its colour in conditions involving blood. In reviewing the literature relating to the plant, Agius de Soldanis in 1746 comments that many of the previous 17-18<sup>th</sup> century writers maintained that it was useful for curing dysentery, bloody evacuations and every haemorrhage in the chest (? tuberculous haemoptysis). It was also deemed useful in treating the gums (? scurvy), haematemesis and for drying wounds. The plant was generally taken as a half gram or more fine dry powder mixed in wine, broth, or any other liquid. Alternatively an ounce of the plant could be mixed with citrus jam or preserve or any other astringent substance. The dose could be repeated until recovery from the disorder<sup>13</sup>. It was considered to be so efficacious that any failure was considered to be a certain indication that the plant used was not genuine. De Soldanis warned foreigners that “It is most important to be careful where they buy this fungus medicine. It has become so popular and the price asked for it is so high that many fake products have appeared on the market products that are not the real fungus but a mixture of other local mushrooms. The buyers will realise they do not have the authentic product when the patient to whom they give it does not get any better”<sup>14</sup>. The plant preparation was “per esperienze medica si vede d’averne piu` efficacia nelle dissenteria il fungo Maltese, che l’antidissenterico americano nominato l’epiquecana”<sup>15</sup>. The plant was also used to control traumatic and surgical bleeding; and was also considered useful for the management of venereal disease. Bonamico wrote that “si trova notato negli scritti d’un antico Medico Gozitano, che il primo effetto, allora quando fu scoperto detto frutto; era per saldare le gonorrea inveterate, ed flussi feminali: anzi vien affermato, che gl’ Inglesi se ne servono solemente per detto morbo.” Accordingly “come costo la` MSS antiche del sudditto Fisico amico mio, che molte donne antiche Maltesi esiliati nel Gozo come disoneste ne faceano diverse cattivi usi di tal piante. Altre poi superstizisamete credono. Ce tenendo tra le mammella appeso tal frutto si auguravano delle future felicitate` : benche poi

quell’ abuso per opera d’un Missionale Cappucinno fu abolito”<sup>16</sup>. The association to venereal disease was probably contributed to by the phallic appearance of the plant and gave rise to the popular use made of the plant by Maltese women.

*Fungus Melitensis* gained increasing popularity and started being exported overseas to Europe. It was considered so efficacious that several Grand Masters sent samples as a gift to various Kings, nobles, relatives and other personalities in Europe. The increasing demand on this restricted plant led to concern on its possible extinction. Legislative measures were enforced controlling the gathering of the plant. Its gathering was solely reserved for the Grandmaster with transgressors facing a penalty of being condemned to the Order’s galleys for a number of years<sup>17</sup>. The legislation failed to adequately control illicit collection. In 1744 Grandmaster Emmanuel Pinto de Foneca, on the advice of engineer Meradon, gave instructions to have the sides of General’s Rock made smooth thus making it more difficult for potential trespassers to climb up the rock. In addition two watchmen were employed at a cost of 50 *scudi* annually in 1746 to guard the rock, these living in a dug-out cavern in Dwejra known as *Ghar ta’ l-ghassa* [Guard Cavern]<sup>18</sup>. In 1785, Jean Houel described the mode of access to General’s Rock<sup>19</sup>. “A la sommite` d` une petite portion de rocher sont attaches deux cables tres-forts, qui par leur autre extremite, viennent toucher l’ecueil ou ils sont aussi arretes; de ces cables pend une grosse ciasse A, semblable a` celles dans lesquelles on plante les orangers. Ces cables sont passes dans des poulies attachees aux quatre angles superieurs de cette caisse, qui peut contenir un ou deux hommes: en tirant un troisieme cable moins tendu, ces hommes sont rouler les poulies sur les deux autres cables & avancer le caisse; ainsi ils passent facilement de la rive a` cet ecueil, ou de cet ecueil au rivage.....”<sup>20</sup>.

The decline of the Order and the civil disorder of the French interlude led to a slackening of the vigilance of guarding the rock. The ensuing abuses forced the British Civil Commissioner Captain A. Ball R.N. to the issue of a specific proclamation on March 1800. “Si proibisce a tutti di raccogliere il Fungus Melitensis. Avendo a caro Sua Eccellenza, che is luoghi produttivi le radici comunemente dette Fungus Melitensis ossia Ghirch Signur si erano mantenuti ed illesi come si mantenevano nell’antico governo ha percio` proibito a qualunque persona di qualunque stato, condizione di non ardire di raccogliere dette radici senza il permesso di Sua Eccellenza o del sue Segretario”<sup>21</sup>.

The plant retained its medicinal reputation during the early decades of the nineteenth century. However by 1821-24, the plant was reported to have “lost its high repute, and is at present very little called for”<sup>22</sup>. The cable-pulley system of carriage to General’s Rock during the earlier part of the nineteenth century was described by George French Angas who visited the rock in 1841. “Our picturesque group halted at the extremity of the point between which and the General’s rock ran an arm of the sea which we had to cross in a small box moved along by a rope and pulleys. When the machinery was adjusted one man crossed the chasm first which was 150 feet wide. On the return of the box I got in and, holding firmly by the rope, I soon reached the opposite side also. The journey over this arm of sea was any thing but pleasant as it consisted of a series of jerks and the landing on the rock was very steep and



dangerous.....Some time since [book published in 1842] the cables of this novel aerial conveyance gave way and precipitated the passenger into the gulf below”<sup>23</sup>. After the accident, the cable-pulley system was not replaced<sup>24</sup>.

The plant and General's Rock have now both been relegated to the annals of medical history and folklore. Because of its rarity and restricted distribution, the plant is now designated a protected species by virtue of Legal Notice 49 of 1993 issued via the Environment Protection Act. General's Rock has also been declared a Nature Reserve by virtue of Legal Notice 22 of 1992. Emulating the legislative situation of the Hospitaller period, access to the rock's plateau is prohibited. Pharmacognostic investigations of the plant have shown that the water-soluble fractions of the fresh juice possess a significant blood pressure lowering activity

in the dog. No such activity was shown with extracts of the dried powdered plant<sup>25</sup>. The lyophilized aqueous extract of the plant has also been shown to have a direct spermatogenic influence on the seminiferous tubules of immature rats presumably by exerting a testosterone-like effect. The extract reduced FSH and testosterone levels<sup>26</sup>. Profound folliculogenesis was also noted when the extracts were given to immature rats<sup>27</sup>.

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3. R.W. Lebling: The treasure of Tarthuth. *Saudi Aramco World*, March/April 2003, 54(2): p.12-17
4. G. Farrugia: *Ghawdex bil-grajja tieghu*. Malta, 1936 fnote. p.144 reported that he had been informed by various individuals that the rock was named *Haget il-General* or General's Rock because the first person who found the plant was a general of a squadron of galleys belonging to the Order. However one would have expected that G.F. Abela [*vide infra*] would have mentioned the discovery that allegedly occurred only about 50 years earlier. He calls the rock *Hagira tal Gernal*. G.F. Bonamico, writing 90 years later, [*vide infra*] also notes that nothing was known as to how the plant was discovered. Bonamico believed that the plant was known and collected by the Punic Maltese. The plant, known as *Tarthuth*, grows in the Middle East and was reputed with medicinal properties by several medieval Islamic physicians.
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10. "But this plant cannot be found in any other European or Asian country at least according to the research conducted up to the present day; because none of the great botanists that have sailed around the countries of these two continents and have written volumes on every plant they have seen growing there, has said he had found a plant like this. Pietro Castello too, a great scholar of medicine and also a great botanist from the University of Messina, when this plant was given to him probably by a Maltese physician, confessed that he had never seen one like it or known that it grows only on our rock."
11. "It is said that by this fungus sick people are cured faster than by any other medicine".
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13. G.P.F. Agius de Soldanis, 1746: *op. cit.*
14. G.P.F. Agius de Soldanis, 1746: *op. cit.*
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17. L. De Boisgelin: *Ancient and Modern Malta*. London, 1805, vol.1:p.71-74; G.P.F. Agius de Soldanis, 1746: *op. cit.*
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20. "To the summit of one part of the cliffs are attached two very strong cables, which, at their extremity reach the outcrop where they are also secured; from these cables hangs a large box (marked A on the plate), similar to the tubs in which orange trees are planted. The cables pass through pulleys attached to the four upper corners of the box, which can hold one or two men; by pulling on a third, less taut, cable the men cause the pulleys to roll on the other cables and move the box forward; thus they can easily pass from the shore to the islet or vice versa."
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23. G.F. Angas: *A Ramble in Malta and Sicily in the Autumn of 1841*. Smith, Elder, and Co.: London, 1842, p.55
24. G.P. Badger, 1838: *op. cit.* Badger also described the cable-pulley system "This rock is about one hundred and fifty feet distant from shore, and is reached by means of a box with a pulley fixed on to each angle and made to run two stout cables, well secured on both sides. After the box is loosed from its position, one of the men in charge takes with him a rope which he ties on to one end of the box and entering into it, impels it on by laying hold of the ropes and jerking it forward until he reaches the rock. He then seizes the small rope which he had previously fixed to the side of the box and suffers his companion to drag it over towards him by means of another which he holds in his hand for that purpose. As soon as the passenger enters, the man on this side slackens his rope and the box glides easily down the cables till about midway, where they bend. His companion on the opposite side then pulls it by main force, until it is sufficiently close to allow of landing without danger. Very lately the cables gave way, and have not yet been replaced."
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