Chapter 7
Uses

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Abstract The many uses of the different parts of *Beta maritima* harvested in the wild are described. Although eaten as a potherb before recorded history, most of our information about the uses of sea beet, and beets in general, are as a medicinal herb because this was the interest of most of the ancient authors who wrote about plants. Many of these medicinal uses have lost their importance with the advances of medical science. Nonetheless, sea beets (and other beets) are still used in homeopathic and "natural" remedies and have a number of useful qualities, both for the smooth function of the digestive tract, and to prevent diseases.

Keywords *Beta maritima* · Digestive aid · Beet juice · Beet fiber · Betacyanin

7.1 Medicinal Uses

Leaves and roots of sea beet have been used since prehistory against several ailments and diseases (Fig. 7.1). Some important applications are recognized by current medicine as well. (http://www.celtnet.org.uk/recipes/miscellaneous/fetch-recipe.php?rid=misc-sea-beet-quiche, http://www.magicgardenseeds.com/BET05). The roots are described as more medicinally effective than the leaves and sea beet as more active than the cultivated beets, stated by Galen around 100 AD. When cooked, the beet loses part of its properties, because the main part of the vegetation matters (Galen 1833).

It was claimed that the Babylonians were relatively immune to leprosy because they frequently ate beets cooked in different ways (Anonymous 2011). According to Theophrastus (400 BC) and Hippocrates (around 460 BC), the raw leaves are good material for binding wounds, whereas the boiled leaves relieve skin burns. Some properties of wild beet juice were listed in the *Herbarium* of Crateuas (around 300 BC): including (i) clears the head; (ii) reduces ear pain if infused in the nose mixed with honey; (iii) fights dandruff; and (iv) mollifies the chilblains. Moreover,

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Fig. 7.1 Drawing of an old “Pharmacia” (1450?), Biblioteca Ariostea, Ferrara, Italy

the leaves used as a poultice heal leprosy, the itching caused by alopecia, and skin sores (Biancardi 2005).

According to Pliny, *Beta candida* possesses purgative properties, whereas the *Beta nigra* was rather astringent. Some digestive properties were listed by Vigier (1718), including the efficacy against the intestine worms. He also noted that the leaves were used to treat burns, and the powder obtained by grinding the seed was useful to relieve dysentery. Dioscorides had the same opinion: the decoction of *Beta candida* softened the intestines, and *Beta nigra* cured diarrhea (Kühn 1829). Beet juice is introduced into nostrils "*expurgat caput*" (lightens the head). The same means and methods were advised by Coles (1657) "against Head-ach and Swimmings therein, and turnings of the Braine." The decoction made using roots and leaves reduced dandruff (Dioscorides 89 mAD); the leaves applied to the skin healed wounds and ulcerations; however, if eaten in excessive quantity, beet increases the evil humors.

In "*Tractatus de virtutibus herbarum,*" (da Villanova 1509) it is possible to find a long list of applications taken, in part, from the Arab physicians Avicenna and Serapion (Fig. 7.2). According to da Villanova (1509), beet juice was useful against San Antony's fire (herpes zoster), infected wounds, and mouth ulcerations. If put in the ears, the juice relieved earaches. Dioscorides wrote that when beet is cooked with vinegar and mustard, it was effective against several diseases of the liver and spleen. Mixed with eggs, it reduced the effects of herpes zoster and skin burns.

Platina (1529) recommended drinking beet juice for reducing garlic breath. The same was advised by Cato (1583). Moreover, it reduces the consequences of summer heat and "*nutrientes foeminas plutimo lacte implet et sedat menstrua*" (brings plenty of milk to nursing women and cures menstrual pains). The sea beet, having a "hot nature similar to saltbush (*Atriplex* spp.) but less humid," causes weakness and slowness (Averroes cited by Bruhnfels 1531). Simone Sethi, cited by Fuchs (1551), together with the recipes of the classic authors, confirmed that the beet juice as being hot in nature (see Galen 1833), "*ventrem constringit et sitim affert*" (it blocks the intestine and makes thirsty).

Jean Ruel in the book "*Diosciridae pharmacorum*" (Ruel 1552) many times referred to *Beta sylvestris*, *Beta agrestis*, as well as to sea beet by its old names, *limonion* and *neuroides* noted and infusion made with leaves was useful against colic (Ruel 1552). The same recipe is mentioned by Ibn Sina (900) in a manuscript in Latin translation "*Liber canonis medicinae*" (Fig. 7.3), and by Ritze (1599). If the leaves of wild beet are chewed, a disease of the eyes named "mal del piombo" in old Italian (likely glaucoma), could be reduced (Durante 1635). The poultice obtained from roots boiled in vinegar relieved a toothache if taken bound into the hands. The same, put under food, cured sciatica. If applied around the wrists, it afforded recovery from scabies. Finally, the juice was effective against the bite of a wolf (Durante 1635).

Bruhnfels (1531), who took references from some Arab authors (Serapion, Averroes, Zacharia, and so on), asserted that sea beet juice is effective for ulcerations of the nostrils, hair loss, lice, and reduced dandruff as well. Dorsten (1540), confirmed that "*Betae omnes frigidam et umidam naturam habent*" (Beets behave a cool and wet nature), and also stated that "*Radix decocta, si inde tres vel quatuor calidae*

Fig. 7.2 Harvest of leaf beets represented on "*Tacuinum sanitatis*" of uncertain origin (1100?) and reporting recipes of Dioscorides and Arab writers

guttae auribus instillentur, tollit dolorem earum" (three or four drops of hot root decoction put into the ears reduce the ache of them).

Parkinson (1629) cited the use of enemas prepared with water used from boiling beet leaves as an effective laxative; "The leaves are much used to mollify and open the belly being used in the decoction of blisters." In "*Stirpium illustrations*" Parkinson (1655) mentioned that *Beta maritima sylvestris minor* due to "… *gustu salso & nitroso commendatur ad hydripicorum aquas educendas*" (the salty and nitric taste of *Beta maritima sylvestris minor* is recommended in edema for reducing the liquid inside the tissues). The same was confirmed by Magnol (1636), who added that sea beet also "*calefacit & siccat*" (heats and dries) owing to its "*nitrositatem*" (high content of nitrogen). If drunk, the decoction improved the function of the spleen and,

Fig. 7.3 School of medicine (Ibn Sina 900?) from Wikipedia

according to Mattioli (1557), relieved itching. Like other vegetables, beet nourishes little, but benefitted the liver, especially if eaten seasoned with mustard and vinegar (Mattioli 1571).

Squalermo (1561) wrote that the cooked roots "conferiscono molto agli appetiti di Venere" (much improved sexual energy). This effect was confirmed by http://www.godchecker.com/. Beets generated good blood, removed stains from the face, and reduced hair loss (de Crescenzi 1605). For Ray, in "Synopsis" (1690), *Beta sylvestris maritima* was a laxative. The pulverized root snuffed up the nose caused sneezing, diminished the bad humors of the brain, and cured headache even if chronic. Meyrick (1790) confirmed the efficacy of this system "in order to provoke the discharge

of humors from the head and parts adjacent." The roots lightly boiled and mixed with vinegar improved the appeal of foods and liver activity. Finally, "*veteres tamen fatuitatem iis exprobant*" (they help recovering the memory of aged people) (Ray 1738).

Ficino (1576) argued that the beet soup, if eaten frequently, is a valid means of protection against the plague. Tanara (1674) quoted the Latin proverb: "*Ventosam betis si sapis adde fabam*" (for reducing the flatulence caused by beet, eat it mixed with broad beans, *Vicia faba* L.). The same author mentioned that pieces of root could be used as a suppository and that the leaves cooked under ashes are effective against burns. Among the negative effects, Tanara, cited Pythagoras, and wrote that the misappropriate consumption of beet may cause excessive amount of fluids in the circulatory system and a disease called "hydropsy" (edema) in tissues.

Dodoens (1586) in "A new herbal or historie of plants," along with the common uses, asserted that the juice of beet "put into the ears takes away the pains in the same, and also reduces the singing or the humming noise." "Beets make the belly soluble and cleanse the stomach," whereas the juice is "a good antioetalgic being poured into the ears; and opens the opulations of the liver and spleen" (K'Eogh 1775). In agreement with Dodoens, the leaves used as impiaster (poultice), reduced the severe effects of choler, and "the roots put as a suppository into the fundament soften the belly."

Quite widespread was the use of beet leaves for binding wounds (Clark 2011). Culpeper (1653) recommended the use of beet juice for reducing headache, vertigo, and all the brain diseases. According to Hill (1820), the white beet juice also was a useful drug for toothache. It promoted sneezing if inhaled through the nose. The red beet root had the same uses but was less effective than the white one and much less still than sea beet. The beneficial action of the juice introduced into the nostrils against headache, even if chronic, was confirmed by Blackwell (1765). Salmon (1710) listed in the "English herbal" both the virtues of the different types of beet, and the different means for using them: (i) liquid juice; (ii) inspissate (thick) juice; (iii) essence; (iv) decoction; (v) cataplasm (poultice); and (vi) saline tincture.

More recently, beet juice (red beet in particular) is considered an effective means for reducing blood pressure (http://en.wikipedia.org/wiki/Beet). Red beet also has been recommended for the prevention of intestinal tumors and the seed boiled in water is said to be effective against the same disease affecting the genital organs (http://dukeandthedoctor.com). Moreover, red beet juice regularly consumed is said to (i) keep the elasticity of arteries; (ii) drop the risk of defects in newborns, because it contains folic acid; (iii) stimulate the function of the liver; (iv) relieve constipation, etc. Beet juice and water boiled with the seed has been said to have therapeutic value against several diseases including cancer (Allioni 1785) and leukemia (Duke and Atchley 1984; http://www.life-enthusiast.com/; http://www.pfaf.org/user/default.aspx).

Another current use of beets is the root fiber, which has higher water- and fat-holding capacity than other dietary fibers. Therefore, for several years, beet fiber (by-product of sugar beet factories, adequately processed) is finding an important use to promote regular bowel movement and as blood detoxifier (http://www.whfoods.

com/). The seed of sea beet, called "silaijah" or "silaigah," has been sold commonly in the Indian and Iranian bazaars for different medical uses (Hooper 1937). The decoction of leaves is used in South Africa as purgative and against hemorrhoids.

An updated list of pharmacological activities of sea- and sugar-beet roots can be found in Jasmatha et al. (2018).

7.2 Food Uses

The beginning of the use of *Beta maritima* as a potherb is lost in the prehistory. At least at the beginning, it likely was limited to the leaves because the roots, woody, fangy, and deep in the soil were not suited for human consumption being too hard for chewing (Fig. 7.4). Among other things, harvest would have been quite difficult. Thus, the root was used only as a botanical drug because of the smaller quantities needed. To make the roots more suited for food, a long selection process to improve the shape, weight, and reduce woodiness was necessary.

The various recipes for preparing the leaves do not always specify whether they are intended for the wild or cultivated plants. However, according to opinions of many, the wild beets are always tastier and more appreciated. Pliny (75 A.D.) reported that the leaves were prepared together with beans, lentils, and mustard, to eliminate their insipidity (Giacosa 1992). With a lightweight placed over the leaves at an early stage, beet develops a broad blanched head "more than two feet" much appreciated by the Romans. This practice also was widespread in Greece (Lindley and Moore 1866).

Some recipes using leaves were given by von Megenberg (1348) in "Das Buch der Natur," which was is believed to be among the earliest printed books. It was explained (in old German) that beet leaves became a good dish especially if mixed with parsley (*Petroselinum* subsp.). In the earlier cited "English herbal," Salmon (1710) wrote that "Beets are used (I mean the root) as a sallet, and to adorn and furnish out dishes of meat withall, being as sweet and good as any carrot. If boiled as carrots, and eaten with butter, vinegar, salt, and pepper, it makes a most admirable dish, and very agreeable with the stomach."

Evelin (1740), after citing some epigrams of Martial, wrote "the rib of the white beet leaves were boiled melts and can be eaten like the marrow (*Cucurbita pepo* L.). But there is a beet growing near the sea called *Beta maritima sylvestris*, which is most delicate of all." The young leaves, collected in winter or early spring, are boiled and in this way become a good wholesome dish (Taylor 1875; Thornton 1812). If harvested later, the leaves taste bitter (www.wildmanwildfood.co.uk). In France, the leaves were often mixed with sorrel (*Rumex acetosa* L.) to lessen the acidity of the latter (Lindley and Moore 1866).

In Ireland, sea beet is well known to people living on the coast, who call it cliff-spinach or perpetual spinach (Fig. 7.4), and frequently cultivate it in their gardens using seed collected on the wild plants (Sturtevant 1919; Henreitte's 2011). The same is done in England. "This form has been ennobled by careful culture, continued until a mangold was obtained" (Sturtevant 1919; Burton and Castle 1838) refers that *Beta*

Fig. 7.4 Drawing of aged plants of *Beta maritima* (Kops et al. 1865)

maritima is extensively used "as a pikle and salad, preserved as a confiture, made a substitute of coffee, and yielding a beautiful varnish." The following information was given by Williams (1857), "sea beet, which frequently grows in great abundance on the sea-beach, the salt marshes, and all about the cliffs, is very useful and is as good as the cultivated spinach. As an edible vegetable it is often cultivated on the coast of Cork."

In Italy, where collection of sea beet is still widespread (Ghiradini et al. 2007) and some attempts of cultivation using wild seed have been made (Branca 2001), the

leaves are mixed with fresh cheese in order to prepare a specialty sort of "tortellini." In another popular recipe, the leaves, boiled briefly, are cooked together with scrambled eggs. Rivera et al. (2006) reported the recipes of two popular dishes from Sardinia (Italy) and Valencia–Alicante (Spain). The first is named "minestra delle 18 erbe" (18 greens soup), and prepared with a mix of *Borrago officinalis*, *Silene vulgaris*, *Beta maritima*, *Carduus spp*, *Sonchus arvensis*, *Papaver rhoeas,* etc. The second, named "Cocas" or "Mintxos," is a sort of pizza filled with fish and wild greens (*Sonchus* spp, *Reichardia* spp, *Beta maritima*, etc.). On the island of Cyprus, the leaves of 11 wild herbs, including sea beet, *Papaver rhoeas*, etc., are used as main ingredient of the traditional pie named "pittes" (Della et al. 2006).

In the kitchen, the young leaves of cultivated types of beet have the same use as spinach (*Spinacia oleracea* L.), which also belongs to the family of Chenopodiaceae. The boiled leaves of beet are perhaps more appreciated than spinach because they are not astringent in taste and "are quite as good" (Johns 1870). Seed of *Beta maritima* to be used in gardens for leaf production is currently sold by some firms such as Magic Garden Seeds (Regensburg, Germany).

According to Pratt (1856) "Of all our sea-side plants, boiled for table vegetables," the one which seemed to the writer of these pages most to deserve commendation for the purpose is the sea beet (*Beta maritima*). Unlike the silvery glaucous foliage of the orache and goosefoot, the leaves of this plant are of a deep rich green color, very succulent and wavy at the edges. This seaside spinach is certainly very wholesome, and if it were not a wild plant would be in much request. The roots of all the beets contain much saccharine matter, and the well-known experiments of the French on another species, the red beet, for the purpose of obtaining sugar, need not be referred to. No such quantity of sugary substance is yielded by other European esculents as by this. This plant is also common as a culinary root and is also frequently used for salads. On some parts of the coast, it is gathered from the cliff or the muddy shore for food, yet it is often left unnoticed. The English proverb, which our old writer, Fuller, so often quotes, "Fetched far, and cost dear, is fit for ladies," applies, seemingly, as well to the other portion of humanity as to the fair sex."

There are countless methods and recipes for cooking the roots. In this case, the type used most often is the red or garden beet. Apicius (35 BC?) provided several methods for cooking beet roots. In a more recent edition of "*Ars Coquinaria*" (Lister 1709), that book was integrated with recipes from other authors like Humelbergius, Barthius, Reinesius, van der Linden, etc. A number of recipes including those of beets are cited in English by Henriette (2011). Atheneus reported that the roots of sea beet have "a sweet taste and grateful, much better than cabbage." According to Ray (1738). "*Beta estur ut olus, eaque nihil in culina usitatius*" (beet is as spinach, and nothing is more used in the kitchen).

The following recipe is given in "The young housewife's daily assistant" (Anonymous 1864), "Wash off the mould, being careful to not to rub the skin; place the beetroot in a moderate oven and bake about two hours. When cold, take off the skin and use the beetroot as may be required. It is very good dressed as cucumber and served with fish and cold meat thus: cut the beetroot into thin slices, sprinkle over a salt spoonful of pepper, the same of salt, two tablespoonfuls of oil, and one of

vinegar." At the site, http://www.guardian.co.uk/, sea beet is described as follows: "dark green, robust, spinach-like leaves, wild chervil, the perfect accompaniment to salmon, sea purslane, delicate, salty, succulent pods that explode on the tongue, and of course no end of chanterelles, morels, ceps and other wild fungi that inhabit our meadows and woods." Countless recipes are available on the WEB for cooking the roots (http://recipes.wikia.com/wiki/Sea_beet; http://www.celtnet.org.uk/recipes/miscellaneous/fetch-recipe.php?rid=misc-sea-beet-quiche; http://www.celtnet.org.uk/recipes/miscellaneous/fetch-recipe.php?rid=misc-sea-beet-quiche.

The fibrous matter extracted from beets added in proper proportion to different foods has the following properties: (i) will keep bread soft for longer time; (ii) improves the action of dough; (iii) reduces grilling losses in hamburger steaks; (iv) fried croquette scarcely burst, and so on (Dillard and Bruce German 2000).

A good beer and a pleasant wine may be made from the fermented roots (Burton and Castle 1838). After acetic fermentation, the sliced root is the main ingredient in the dish named "barszcz" in Poland and "borscht" in the Balkan countries (Chaumeton 1815). Beet soup is listed among the foods of propitious omen to be eaten by the Jewish people on the first day of the year (www.jewishencyclopedia.com). Betacyanin, the main pigment of red beet, may cause red urine in organisms unable to break down it (http://en.wikipedia.org/wiki/Beeturia).

The dried root was used as a substitute for coffee (Miller 1768). During the last world war, the beets were considered one of the better vegetables suited to be canned for the Allied soldiers (http://aggie-horticulture.tamu.edu). In 1975, a sort of beet purée was served on board of Soyuz 19 shuttle during the meeting with the Apollo 18 astronauts. The food was canned in tubes like toothpaste and it was squeezed in the mouth (http://www.healthdiaries.com/eatthis/25-facts-about-beets.html). The very latest citation of sea beet as food is described on the application "Ultimate SAS Survival Guide" downloadable on mobile phones and similar devices. Here, *Beta maritima* is listed along with the edible plants available in case of emergence along the European seashores (Wiesemann 2010).

7.3 Other Uses

When stored wine has the flavor of cabbage, it can be remedied by soaking in beet leaves, and the water utilized for boiling beet roots removed stains from fabrics, parchment, and clothes (Pliny 75 A.D.). The decoction also removed lice from hair (Bruhnfels 1531), whereas the beet juice was useful for polishing gold and silver (Berthelot and Ruelle 1888). A beauty mask prepared with a mixture of gridded beet root and milk cream was said to be very effective for delaying the signs of the age from the face (Messegué 1979).

Sea beet has a high salt-removing capacity, which is helpful where the soil salinity is high (Aksoy et al. 2003). Trist (1960) asserts that *Agropyron pungens* is the best grass for sea walls. *Beta maritima* is considered a particularly damaging weed because its deep roots can make conditions favorable for erosion. Moreover, roots

create holes in the dams, through which water under pressure can easily penetrate easily enlarging the hole. The pathogens of several diseases, including beet yellows virus (BYV), beet mosaic virus (BMV), the causal agents of rust (*Uromyces betae*) and downy mildew (*Peronospora schachtii*), respectively, were found to be common in sea beet growing on the seashores of southern Wales and southern England. In early spring, the viruses infecting the overwintering beets are easily transmitted by aphids into the cultivated beet fields (Gibbs 1960; Sorensen and Marcussen 1996).

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