

Purslane (*Portulaca oleracea*) - the global panacea

Anthony C. Dweck FLS FRSC FRSH

Consultant, Dweck Data

Personal Care Magazine 2, 4, p.7-15. (2001).

INTRODUCTION

Once in a while one comes across a plant that is so outstanding, that one wonders how on earth it has been overlooked. Purslane (*Portulaca oleracea*) is one such plant. It is fascinating that a plant so prevalent around the world has achieved almost identical recognition in each culture for its benefits. The use of this plant as a vegetable, spice and medicinal plant has been known since the times of the ancient Egyptians and was popular in England during the Middle Ages [Lanska, 1992], why it has fallen into obscurity is quite strange.

New? I think not, read what Culpeper had to say in 1653.

Garden Purslain (being used as a sallad herb) is so well known that it needs no description; I shall therefore only speak of its virtues as follows.

Government and virtues : 'Tis an herb of the Moon. It is good to cool any heat in the liver, blood, reins, and stomach, and in hot agues nothing better. It stays hot and choleric fluxes of the belly, women's courses, the whites, and gonorrhæa, or running of the reins, the distillation from the head, and pains therein proceeding from heat, want of sleep, or the frenzy. The seed is more effectual than the herb, and is of singular good use to cool the heat and sharpness of urine, venereous dreams, and the like; insomuch that the over frequent use hereof extinguishes the heat and virtue of natural procreation. The seed bruised and boiled in wine, and given to children, expels the worms. The juice of the herb is held as effectual to all the purposes aforesaid; as also to stay vomitings, and taken with some sugar or honey, helps an old and dry cough, shortness of breath, and the phthisick, and stays immoderate thirst. The distilled water of the herb is used by many (as the more pleasing) with a little sugar to work the same effects. The juice also is singularly good in the inflammations and ulcers in the secret parts of man or woman, as also the bowels and hæmorrhoids, when they are ulcerous, or excoriations in them. The herb bruised and applied to the forehead and temples, allays excessive heat therein, that hinders rest and sleep; and applied to the eyes, takes away the redness and inflammation in them, and those other parts where pushes, wheals, pimples, St. Anthony's fire and the like, break forth; if a little vinegar be put to it, and laid to the neck, with as much of galls and linseed together, it takes away the pains therein, and the crick in the neck. The juice is used with oil of roses for the same causes, or for blasting by lightning, and burnings by gunpowder, or for women's sore breasts, and to allay the heat in all other sores or hurts; applied also to the navels of children that stick forth, it helps them; it is also good for sore mouths and gums that are swollen, and to fasten loose teeth. Camerarius saith, the distilled water used by some, took away the pain of their teeth, when all other remedies failed, and the thickened juice made into pills with the powder of gum Tragicanth and Arabic, being taken, prevails much to help those that make bloody water. Applied to the gout it eases pains thereof, and helps the hardness of the sinews, if it come not of the cramp, or a cold cause. [Culpeper, 1995]

PHARMACOPOEIAS

The plant has been reported official in the French, Mexican, Spanish and Venezuelan Pharmacopoeias [Quisumbing, 1978].

THE COMMON NAMES

The name *Portulaca* is thought to be derived from the Latin 'porto' to carry and 'lac' meaning milk, since the plant contains a milky juice. [Boulos and el Hadidi, 1984].

Aborigine: *Thukouro* of the aboriginals of the Cloncurry River, North Queensland. [Maiden, 1889].

African: **Ashanti:** *adwere*; **Bambara:** *missed kumbare*; **Efik:** *eferemakara*; **Ewe:** *afiaa, devio-fe'ama*; **Hausa:** *baba jibji, halshen saniya*; **Mano:** *toa p'lo*; **Malinke:** *Mazahi*; **Mende:** *tanguipeta*; **Xhosa:** *igwanitsha*; **Yoruba:** *papas an*; **Zulu:** *amalenyane*. [Iwu, 1993]. **Malawi dialects:** *Matakoatsanu* (N), *Mataga atsanu* (Y), *Matakaoli* (To), *Matakogwaoli* (Nk) - all these names mean literally "the buttocks of the wife of a chief" from the shape of the leaf, *Kokwa* (Tu). [Williamson, 1956].

Afrikaans: *Porselein* [Wyk & Gericke, 2000]. **South Africa:** *Purslane, Misbredie, Postelien, Varkkos, Suto:* *selêlê* [Watt & Breyer-Brandwijk, 1932].

Arabic: *Rigla; Rashad; Hurfa; Baqlet el-hamqa, Baqlet el-mubareka; Farfah; Dhou el-keffin, Aben drag, Brabra, Ornoba, Bou el-kazit, Berdougala, Bleibsha.*

Arabic and Persian: *Kurfa.*

Australian: *purslane, munyeroo, wakati, lyawa.* [Low, 1991].

Bengali: *Baraloniya.*

Berber: *Tafrita; Rejla, Arhilem, Bouguel, Benderakesh.*

Bombay: *Kurfah.*

Can: *Duda-gorai.* [Nadkarni & Nadkarni, 1999].

Caribbean: *Pussley; purslane; hog bhaji/meat; poupyé; koupyé.* [Carrington, 1998].

Chinese: *Ma Chi Xian* [Reid, 1993]. *Ma Chia Xian* [Bown, 1995].

English: *Garden purslane, pigweed, pursley, pusley, wild purslane, common purslane, purple-flowered purslane* (author: this is odd, because the flowers are yellow!), *kitchen-garden purslane, green purslane, common Indian parselane..* Originally of Asian origin, the English name purslane, has unexplained etymological connection through early French and Italian with porcelain [Burkill, 1997].

French: *Pourpier; Pourcellaine, Pourpie potager.* [Boulos, 1983].

German: *Gartenportulak.*

Gujarati: *Loni; Ghol.*

Hindi: *Kursa.*

Hindi & Bengali: *Chhota Lunia.*

Italian: *Porcellana, portulaca* [Leyel, 1987]

Mah: *Bhuiigoli; Ghoibhaji; Motighol.*

Mexican: *Verdolagas* [Herbalist, 1988]

Philippino: *Alusíman* (Bik.); *ausíman* (Bik.); *bakbakad* (if.); *dupdupil* (Bon.); *golasíman* (Tag.); *gulasíman* (Bik.); *kantatába* (Pang.); *kolasíman* (Tag.); *lungum* (If.); *makabling* (Tag.); *ngalug* (Ilk.); *olasíman* (Bik., Tag.); *ulisíman* (Bik., Tag.). [Quisumbing, 1978].

Punjabi: *Lonak; (seeds) dhamni.*

Sanskrit: *Brihalloni, Gholika, Lona, Lonamla, Loni, Lonika, Lunia.* [Jayaweera, 1982].

Sind: *Lunak*.

Sinhalese: *Gendakola*.

Spanish: *Verdolaja*.

Tamal: *Parukire; Parpukire*.

Tamil: *Karikkirai, Parupukkirai, Passalakkirai, Pulichchankirai, Pulikkirai*.

Telulelam: *Peddapavila kura*.

Trinidad & Tobago: *pursley* or *pusley*. [Seaforth & Adams, 1985].

Uriya: *Puruni-sag*.

Vietnamese: *Rau sam, mã hiên, phjác bia, slòm cà* (Tay). [World Health Organisation, 1990].

FOLKLORE

Purslane in ancient times was looked upon as one of the anti-magic herbs, and strewn around a bed was said to afford protection against evil spirits. [Grieve, 1998]. It was supposed to protect from evil spirits and if carried was supposed to attract love and luck. It was carried by soldiers to protect themselves in battle. If laid on the bed, it was believed to protect that person from having nightmares. [Lavender and Franklin, 1996]

It is under the dominion of the moon [Leyel;1987] and is supposed to work on the psychic senses and taken regularly helps develop clairvoyant faculties [Lavender and Franklin, 1996]. The infusion may be used to clear the third eye and to wash the crystal ball or scrying mirror [Lavender and Franklin, 1996], no doubt a useful tip for our marketing colleagues!

The Chinese believed that the drug contained a "vegetable mercury". [Reid, 1993]

In Ghana it is an emblem of peace and is mixed with oil to act as a palliative against evil spirits. It has use in religious ceremonies and in purification after sickness. It is a children's charm for good luck. In Yoruba folklore all the plants of the forest owed money except *papas an* who paid his debts. Hence the plant features in an incantation for the recovery of owed money, and the Yoruba name meaning 'stick pays'. In Lesotho the plant is a protection against illness and lightning. [Burkill, 1997]. It is used as a charm by the Suto [Watt & Breyer-Brandwijk, 1932].

COMPOSITION

Purslane contains large amounts of *l*-norepinephrine (*l*-noradrenaline; 0.25% in fresh herb), a neurohormone that has vasopressor and antihypotensive activities and reduces haemorrhage at the tissue level.

It also contains numerous common nutrients (varying from low to high concentrations depending on report), including: vitamins (A, B₁, B₂, C, niacinamide, nicotinic acid, α -tocopherol, β -carotene, etc.); minerals (especially potassium); fatty acids, especially omega-3 acids whose concentration in purslane is the highest found in leafy vegetables; glutathione; glutamic acid; and aspartic acid. Other constituents include a mucilage composed of an acidic and a neutral fraction with structure determined, calcium oxalate, malic and citric acids, dopamine and dopa, coumarins, flavonoids, alkaloids, saponins, and urea among others used [Leung & Foster, 1996].

The plant contains urea, vitamin C, ash 1.6%, and fat 4% [Quisumbing, 1978].

It is rich in ascorbic acid and assays in the USA have shown 420-700 mg per 100 g. It has been suspected of poisoning stock and up to 9% oxalic acid on dry weight has been analysed, but toxicity has been discounted. The plant is rich in calcium and iron [Burkill, 1997]. Certain leaf extracts have been found to cause more vigorous contractions of the heart probably due to the presence of levartenol, a substance known to raise the blood pressure and lower the heart rate [Burkill, 1997].

Recent research has shown that *P. oleracea* is a rich source of omega-3 fatty acids, which are thought to be important in preventing heart attacks and strengthening the immune system [Bown, 1995].

Oxalates and noradrenalin have been isolated from the plant. The plant also contains saponins [Iwu, 1993]. The plant contains tannin, phosphates, urea, and various minerals with a large amount of magnesium [Keys, 1976].

A new monoterpene glucoside, portuloside A, was isolated from the MeOH extract of aerial parts of *P. oleracea* (collected from Japan). Its structure was established from spectral data and chemical synthesis from linalool [Sakai *et al*, 1996].

The whole plant contains carotene, vitamins C, B₁, B₂, PP; Ca, Mg, Na, K salts; organic acids, nicotinic and oxalic; noradrenaline, and the biflavonoid liquiritin [World Health Organisation, 1990].

USES

General

It is eaten as a salad and vegetable all around the world and used medicinally for a variety of conditions that include headache, stomach ache, painful urination, enteritis, mastitis, lack of milk flow in nursing mothers and in postpartum bleeding. Externally it is used to treat burns, earache, insect stings, inflammations, skin sores, ulcers, pruritis (itching skin), eczema and abscesses. These conditions are usually treated with the fresh herb used as a poultice or the expressed juice is used [Leung & Foster, 1996].

An aqueous extract of purslane was shown to have skeletal muscle relaxant effects both *in vitro* and *in vivo*; it also relaxed guinea pig gastric fundus, taenia coli, and rabbit jejunum as well as contracted the rabbit aorta and raised blood pressure. Topical application of the aqueous extract onto the skin was effective in relieving muscle spasms [Leung & Foster, 1996].

Other effects include: antibacterial and antifungal; wound healing; anti-inflammatory; uterine stimulant and diuretic in rabbits. Although norepinephrine may account for some pharmacologic activities, the active principle for most of the biological activities and medicinal properties of purslane are still unidentified [Leung & Foster, 1996].

AFRICA

The whole plant is considered antiphlogistic (takes the heat out) and bactericide in bacillary dysentery, diarrhoea, haemorrhoids, enterorrhagia. It has been used in prescriptions as an antidiabetic. Externally it is used as a cataplasm of fresh leaves for maturing of abscesses. The whole plant is said to be anaphrodisiac (opposite to aphrodisiac!), emollient, calmative, diuretic, a refreshing agent, antiscorbutic, vermifuge. The seeds are also calmative and will help slake a thirst [Boulos, 1983].

An infusion is used as anthelmintic for children to expel roundworms, and in high doses as an emetic. The crushed plant is applied locally on swellings, bruises, and on whitlow to ease pain and cause healing. The pressed juice is instilled in the ears for earache, and also applied with cotton lint to carious teeth. The leaf infusion has been reported as a cooling drink, with a mild diuretic effect, and used as a vegetable for its antiscorbutic properties. The seeds are demulcent, diuretic, and slightly astringent. The plant has been attributed with insecticidal properties [Iwu, 1993].

The extract has been shown to possess antidiabetic and muscle relaxant activities. The muscle relaxant effects have been found to be similar to the activity of D-600 and dantrolene when tested against rat hemidiaphragm and frog rectus abdominus, and the mechanism of action has been suggested as probably due to the inhibition of transmembrane Ca^+ influx, interference with Ca -induced Ca^+ release process and/or interference of the release of intracellular Ca^+ from stores in the sarcoplasmic reticulum. Extract of the plant has also produced a dose-dependent relaxation of guinea pig fundus, taenia coli, and rabbit jejunum, as well as dose-dependent contraction of the rabbit aorta. On spontaneously beating rabbit right atria and electrically paced left atria, the extract produced dose-dependent negative inotropic and chronotropic effects, and pressor response in the rat. It has been argued that the extract may act in part on postsynaptic α -adrenoceptors and by interference with transmembrane calcium influx [Iwu, 1993].

Constituents: oxalic and ascorbic acid contents may be high, as well as the content of noradrenaline. The plant pigments are betacyanins [Seaforth, 1988].

Congo (Brazzaville)

The herb is used generally for heart trouble. A similar preparation is used as a sedative in fits of insanity [Burkill, 1997].

Gabon

It is used in poultices for maturing abscesses and boils. A decoction is used in lotion as an anodyne on the forehead for headache [Burkill, 1997].

Ghana

The leaves are ground, mixed with oil, and tied on boils to bring them to a head [Quisumbing, 1978], sometimes in combination the leaves are also eaten with tiger nuts (*Cyperus esculentus*) as a remedy for skin diseases and chancres. A decoction made by steeping or macerating the leaf in (cold) water is used for heart palpitations [Burkill, 1997; Quisumbing, 1978]. The fresh leaf is applied as a poultice to sprains and swellings [Carrington, 1998].

Ivory Coast

The Ebrie prepare a plaster, which disperses inflammation from an abscess, so relieving the patient from needing to have it lanced. The plant is also mixed with grains of paradise (*Aframomum melegueta*) and karate butter that provides an ointment that is applied to areas of costal pain. The Baule pulp the plant to use as an asthma-treatment [Burkill, 1997].

Liberia

It has been reported fed to a baby, which has ceased to thrive. It is used as an anodyne to pain and as a gastric sedative [Burkill, 1997].

Malawi

The leaves are cooked without potashes; sometimes *bonongwe* (*Amaranthus lividus*) is mixed with them. The product is soft and well liked but does not seem to be often eaten. The leaves are eaten raw as salad by the French [Williamson, 1956].

Mauritania

It provides grazing for cattle, pigs and sheep [Burkill, 1997].

Nigeria

The plant is used as a diuretic. The bruised leaves are used in external application for erysipelas and also for the treatment of burns. Near Benin the plant, along with other ingredients is taken as an aid to the development of the foetus. Leaves of Nigerian material have been found to contain a trace of alkaloid. Norepinephrine and an unnamed alkaloid have been reported, and glycosides, flavone, pigments and a number of other substances. The seeds contain a fixed oil of about 17.4% concentration and containing β -sitosterol [Burkill, 1997]. The leaves are applied topically to swellings [Quisumbing, 1978].

North Africa

The whole plant is antiphlogistic and bactericide in bacillary dysentery, diarrhoea, haemorrhoids, enterria; enters into prescriptions as antidiabetic; externally used as cataplasm of fresh leaves for maturing abscesses; whole plant anaphrodisiac, emollient, calmative, diuretic, refreshing agent, antiscorbutic, vermifuge. Seeds calmative and slake thirst [Boulos, 1983].

Senegal

The plant is used as a diuretic an effect that might be attributed to the content of potassium and iron [Burkill, 1997].

South Africa

This succulent weed is a favourite vegetable in all parts of Southern Africa. Children eat the leaves raw [Wyk & Gericke, 2000]. It is recognized beneficial for the treatment of haemoptysis and pulmonary diseases [Burkill, 1997].

Tanganyika

The slightly cooked plant is used for abscesses and carbuncles. The plant is used as an asthma-treatment. The whole plant is administered to prevent miscarriage. The roots are also used as part of a snake bite remedy [Burkill, 1997].

Ubangi

It is used for sprains and fractures. Leaves soaked in oil are rubbed over the body for debility and pains in the shoulders [Burkill, 1997].

W. Africa

A remedy for haematuria and other urinary troubles. Crushed with native natron and oil an application is made for swellings, bruises, whitlow, etc. Plant sap is sometimes used in ear instillations for earache and also for toothache. It is an ingredient of a Hausa prescription for syphilis [Burkill, 1997; Quisumbing, 1978].

AMERICAN INDIANS

Portulaca seeds were found in 1974 at salt caves in Kentucky and were determined by radio carbon dating to have been collected in the first millennium B.C. [Coffey, 1993] by prehistoric man.

It is used as a potherb and vegetable and was often added to soups. [Scully, 1970]. Scully goes on to quote John Evelyn "*Purslane ... whilst tender, next the leaves with the young stalks being eminently moist and coling, quickens appetite, assuages thirst and is very profitable for hot and bilious tempers as well as sanguine, and generally entertained in all our sallets, mingled with the hotter herbs.... Some eat it cold, after it has been bloiled which Dr. Muffet would have in wine for nourishment*".

The plant was used as a poultice for burns and they also used the juice for earache. This juice was also considered a remedy for caterpillar stings. [Foster & Duke, 1990]

The American Indians used purslane for the treatment of colds and used a decoction of the herb for gout, and also taken for headache. The juice of the plant was used for inflammation of the male genitalia. The leaves were infused in linseed as a liniment for a stiff neck. The Indians used the plant for treating stomach ache, for excessive menstrual flow and mixed the juice of the plant with honey to prepare a cough mixture. The bruised and boiled seed were used to rid worms and the decoction used for gonorrhoea [Scully, 1970].

AUSTRALIA

Tiny black pigweed seeds were a staple food of outback Aborigines. When the stems turned pink the plants were harvested and piled onto hard ground, bark or kangaroo skins. After a few days, seeds fell from the plants and could be gathered up, ground into a paste and cooked [Low, 1991], they were often made into cakes [Urban, 1990]. The aborigines eat the seeds roasted [Burkill, 1997]. It should be harvested before it flowers, and leaves and young shoots added to any salad, where its succulent leaves will have a cooling effect [Woodward, 1990]. The older shoots are used as potherb or for pickling. Explorers, pioneers and Aborigines used Munyeroo as a vegetable – raw and cooked – and relied on its effectiveness against scurvy [Urban, 1990]. It is also possible to pickle the leaves, add them to soups, and use them in sandwiches [Woodward, 1990].

It is found in all the colonies except Tasmania [Maiden, 1889].

Botanist Joseph Maiden mused in 1989: “One would suppose that so small a seed would scarcely repay the labour of collecting”, but noted that “the natives get in splendid condition on it.” The seeds are a good source of protein and fat.

Aborigines also cooked and ate the roots, and ate the stems raw, which were steamed, or ground into a paste. Boiled, pigweed was the most widely eaten of colonial bush vegetables, and is sometimes still collected today [Low, 1991; Urban, 1990]. For centuries it has been used medicinally, and as a vegetable.

P. oleracea is a common weed in Australia which can be used as a demulcent, diuretic, antiinflammatory and antibiotic. Two case studies are reported involving the medicinal use of *P. oleracea*. In the first case, a 52-year-old woman with cystitis was successfully treated with *P. oleracea* juice. In the second case, a 43-year-old man requested relief from the symptoms of his gastric ulcer and was successfully treated with *P. oleracea* in combination with 2 other medicinal plants (*Glycyrrhiza glabra* and *Geranium maculatum*) [Cowper, 1996].

The seeds were reported to have vermifuge properties and have been used medicinally (by Palmer in 1883 not cited). The herb possesses anti-scorbutic properties [Maiden, 1889]. It is considered a cooling diuretic, and the seeds were once thought to be anthelmintic but are now known to be inert [Webb, 1948].

CHINA

Its earliest recorded use in China dates back to around 500 A.D. [Bown, 1995] in the *Ben Cao Jing Ji Zhu*. Traditionally considered sour tasting and cold, with heat-relieving and detoxicant (*qing re jie du*). It was considered to have blood-cooling and haemostatic properties and so used internally in bleeding bacillary dysentery [Keys, 1976], haematochezia (bloody stool), bleeding haemorrhoids [Keys, 1976] and metrorrhagia. Externally it is used to treat much the same conditions as above. In addition to using the fresh herb, the Chinese use decoctions and powder of the dried herb for topical application. In recent years, it has also been used to treat colitis, acute appendicitis, diabetes, dermatitis and shingles [Leung & Foster, 1996].

The whole plant (*ma chia xian*) and leaves are used. It is a sour, diuretic, cooling herb that lowers fever and clears toxins. It is therefore effective against many bacterial infections [Bown, 1995].

In China, the leaves are used for poulticing tumours, bad wounds and ulcers, and oedematous swellings; also for blennorrhagia and leucorrhoea. The seeds in decoction are considered excellent diuretic [Quisumbing, 1978].

Used as antiphlogistic (antipyretic [Reid, 1993]), diarrhoea, haemorrhoids, enterorrhagia [Keys, 1976], also described as antidote; refrigerant; antidysenteric [Reid, 1993]. It is indicated for amoebic dysentery; haemorrhoids; abscesses due to heat excess.

It has been reported that in China the plant is used as an emollient [Quisumbing, 1978]. The Chinese eat this plant as a vegetable; may be used safely in high dosages; the fresh herb is best for all therapeutic purposes [Reid, 1993].

COCHIN-CHINA

The seed is frequently used as a stomachic and a provocative of the menses, as well as an emollient and diuretic [Quisumbing, 1978].

COLOMBIA

It has been reported that the plant is used as an emollient, and is applied to tumours and callosities [Quisumbing, 1978].

EGYPT

The plant is used as a vegetable. The cataplasm of fresh leaves is used for maturing abscesses. The whole plant is considered emollient, calamative, diuretic, refreshing and is also thought to be a vermifuge. [Boulos and el Hadidi, 1984]

EUROPE

Medicinally, it was highly recommended for many complaints. The expressed juice, taken while fresh, was said to be good for strangury (painful spasms during urination), and taken with sugar and honey to afford relief for dry coughs, shortness of breath and immoderate thirst. It is used externally for inflamed and sore skin [Grieve, 1998]. It is also described as choleric (stimulating the excretion of bile by the liver) and depurative (an agent that purifies) [Chiej, 1984]

The herb has been bruised and applied to the forehead and temple, to allay excessive heat, and has also been applied to the eyes to remove inflammation [Grieve, 1998].

The juice, with oil of roses, was recommended for sore mouths and swollen gums. It has also been employed to fasten loose teeth [Grieve, 1998]. "*Camerarius saith, that the distilled water took away the pains in the teeth waen all other remedies failed*" [Leyel, 1987]

Parkinson in 1629 (uncited) said to use "*purslane for blasting by lightening, or planerts or for burning by gunpowder or other wise*".

The tasty leaves and stems are stripped from the stalks and used to make nutritious brown-bread sandwiches [Loewenfeld & Back] the authors also give details for the preparation of a pickle from the thick stems. The use of this plant as a vegetable, spice and medicinal plant has been known since the times of the ancient Egyptians and was popular in England during the Middle Ages [Lanska, 1992].

GUADALUPE

It has been reported that the plant is used as a tonic and febrifuge [Quisumbing, 1978].

INDIA

The leaf juice is used in spitting of blood. [Nadkarni & Nadkarni, 1999; Drury, 1873], the native doctors use the plant in inflammations of the stomach [Drury, 1873].

Bruised and applied to the temples it allays heat, and such pains as occasion want of rest and sleep. It acts as a refrigerant and alterative in scurvy and liver diseases [Drury, 1873].

The fresh leaves bruised are applied to the temples to allay excessive heat and pain; and are also used as a cooling external application in erysipelas and an infusion of them is given as a diuretic. Sour leaves are used as a vegetable [Nadkarni & Nadkarni, 1999]. The bruised fresh leaves are prescribed by Tamil practitioners as an external application in erysipelas; an infusion of them is also ordered as a diuretic in dysuria [Quisumbing, 1978]. Herb is chiefly valued as a refrigerant and alterative pot herb, particularly useful as an article of diet in scurvy and liver diseases [Nadkarni & Nadkarni, 1999].

Young stems and leaves are cooked like spinach, with salt and chillies, and are also used in curries [Nadkarni & Nadkarni, 1999]. Juice of the stems may be beneficial in cases of prickly heat and also soothing to hands and feet whenever a burning sensation is felt.

Plant and seeds are used in diseases of the kidney and bladder, as strangury, dysuria, haematuria, gonorrhoea etc., and also for diseases of the lungs. The plant is also used in haematemesis, haemoptysis, etc. Externally it is used as an application to burns, scalds, and various forms of skin diseases [Nadkarni & Nadkarni, 1999].

The seeds are described as demulcent, slightly astringent and diuretic; while the leaves are described as astringent, refrigerant diuretic and emollient [Nadkarni & Nadkarni, 1999]. They are beneficial to the intestinal mucous membrane and therefore relieve tormina, tenesmus and other distressing symptoms in dysentery and mucous diarrhoea, particularly when combined with other drugs of similar nature [Nadkarni & Nadkarni, 1999]. The seeds are said to be used as a vermifuge, and to be useful in dyspnoea [Drury, 1873].

Seeds are vermifuge [Nadkarni & Nadkarni, 1999].

INDO-CHINA

A decoction of the leaves is given in dysentery [Quisumbing, 1978].

JAMAICA

This plant is common to both Indies. It is given as a cooling medicine in fevers [Drury, 1873; Quisumbing, 1978].

KOREA

Studies were designed to determine the potential cytotoxic activity of methanolic extract of 65 crude drugs against leukaemia L1210 and P388D₁ cell lines in vitro. Of these, twenty-five samples were selected, and the n-Butanol extracts of these samples

were screened for cytotoxicity; 9 extracts were selected and the samples were screened for potential antitumour activity *in vivo* using P388D₁ (life span) and sarcoma 180 (tumour weight) models. On the basis of their results, *Portulacae Herba* [*Portulaca*] was found to be effective [Choi *et al*, 2000].

The antifungal activity of *P. oleracea* (collected from Korea Republic) extracts against hyphal growth of various fungi was evaluated in real time using an automatic single-cell bioassay system. Target organisms were the filamentous fungi *Aspergillus* and *Trichophyton* and the yeast *Candida*. A crude sample obtained by ethyl acetate extract showed a specific and marked activity against dermatophytes of the genera *Trichophyton* [Oh *et al*, 2000].

MALAYSIA

It is regarded as a good tonic for general debility and possesses anti-scorbutic, emollient and sedative properties. [Leyel; 1987]

MIDDLE EAST

The leaves are cooked as a vegetable, pickled in vinegar, and added to sauces and salads, especially in the Middle Eastern *fattoush*.

It is used internally for dysentery, acute enteritis, appendicitis, mastitis, haemorrhoids, and post partum bleeding. Not given to pregnant women or to patients with digestive properties. Externally for boils, snake bites, bee stings, and eczema.

NORTH AMERICA

In North America it has been considered a cooling diuretic (increases urine secretion), and the seeds at one time were thought to be anthelmintic (destroys intestinal parasitic worms), though now known to be inert. The plant is edible [Watt & Breyer-Brandwijk, 1932; Quisumbing, 1978].

PHILIPPINES

Olasíman is a very common weed found throughout the Philippines in settled areas, and is now occurring in all warm countries [Quisumbing, 1978]. It is edible in the form of a salad or as a condiment with meat or fish. The leaves are succulent and acid. It has been said to be an excellent source of calcium and iron [Quisumbing, 1978].

The plant has long been used as a domestic remedy as a vulnerary, antiscorbutic, refrigerant and mildly diuretic. It is also said to be useful in catarrhal affection, of the genito-urinary tract. At the present day the herb is chiefly valued as a refrigerant and alterative pot-herb, particularly as an article of diet in scurvy and liver disease [Quisumbing, 1978].

PUNJAB

It is reported that the seeds have always been attributed with anthelmintic properties. In the Punjab they are given as a vermifuge. It has also been reported that they are used in the Punjab and Cashmere by the hakims in inflammations of the stomach and in internal ulcerations. The seeds have also been prescribed in dysentery and mucous diarrhoea. It has been recorded that the seeds are considered to be tonic and constructive and are prescribed for opacities of the cornea and for the intestines [Quisumbing, 1978].

SRI LANKA

It is a vulnerary, antiscorbutic, refrigerant and mild diuretic. It is useful in catarrhal and urino-genital ailments. It is an article of diet recommended for scurvy and liver diseases. The leaves are used for poulticing boils, ulcers and wounds and to heal burns and cure skin diseases. In the form of an infusion or decoction, they are used as a gastric sedative, diuretic and in the treatment of dysentery. The seed is a stomachic, emollient and diuretic [Jayaweera, 1982]. It is employed for treating dysentery and internal ulcerations of the stomach. In Africa, the plant is used as a sodorific, antiscorbutic and for treatment of haemoptysis, pulmonary and skin diseases and as a snake-bite remedy. It is cooked and eaten as a vegetable [Jayaweera, 1982].

SIBERIA

In Siberia the herb is used as a gastric sedative. The herb, bruised and applied to the forehead and temple, is said to allay excessive heat and pain, and applied to the eyes, to remove inflammation. [Quisumbing, 1978].

TRINIDAD AND TOBAGO

Culinary herb of antiquity and used in salads and *callaloo* in some islands [Carrington, 1998].

A tisane or decoction [Seaforth, 1988] is given for heart palpitations and a tisane of the plant is drunk as a vermifuge [Burkill, 1997]. For worms in children, the fresh leaves are eaten with a little salt. Also a tea made from the leaves is used for the same purpose. Wong (1976, uncited) states: "Herb teas for intestinal worms, palpitation and empacho." [Seaforth & Adams, 1985]. Insecticidal activity has been attributed to the plant (Morton, 1981 uncited).

The crushed plant is used as a poultice on swellings and bruises and the raw plant is eaten to overcome chronic constipation. Plant extracts show muscle relaxant properties when applied topically. The plant is described as pesticidal (Grainge et al, 1985 uncited). [Seaforth, 1988]

The fresh leaf is applied as a poultice to sprains and swellings in the Caribbean. Application of the crushed leaves also apparently soothes prickly heat [Carrington, 1998].

VIETNAM

The whole plant is used, except for the roots, is gathered in summer and autumn and used fresh.

Except for the roots, the entire plant is used as an antibacterial, anti-inflammatory and anthelmintic. It is used in treating bacillary dysentery and dysuria, in a dose of 250g of fresh plant in the form of a decoction. A combination with equal parts of *euphorbia thymifolia* is also used. The juice extracted from 100g of pounded fresh plant and diluted with water serves as an anthelmintic against oxyuriasis and ascariasis. It is administered in the morning for 3-5 days. Poultices of fresh leaves are used to treat mastitis, boils and impetigo [World Health Organisation, 1990].

DOSAGE LEVEL

Dose 7-10g. [Keys, 1976]

Dosage: 10-30g. [Reid, 1993].

Dosage: Seeds may be administered in doses of from 30 to 60 grains and the expressed juice from 1 to 2 fluid ounces or as an infusion of the leaves and seeds. The herb abounds in a milky juice. A paste is made of it with *gokhru*, *kakdibij* and *javakharis* used in gonorrhoea, scanty urine etc., dose is 2 to 3 ounces [Nadkarni & Nadkarni, 1999].

Dosage: It is used in treating bacillary dysentery and dysuria, in a dose of 250g of fresh plant decoction. The juice extracted from 100g of pounded fresh plant and diluted with water serves as an anthelmintic. It is administered in the morning for 3-5 days [World Health Organisation, 1990].

TOXICOLOGY

Accused of poisoning sheep and cattle; deaths said to be due to hoven (White, 1935) Found to contain up to 9% oxalic acid (dry weight). Prolonged ingestion of the plant was stated to cause incoordination of gait and tetanic conditions in sheep. Further experiments, in which three sheep were fed plants containing 6.1 and 3.5% oxalic acid dry weight failed to produce any disorders in calcium metabolism analyses and post mortem findings were described [Webb, 1948]. Oxalates and nor-adrenaline have also been isolated from (*P. oleracea*) indicating a possible hazard in the taking of its teas (Adams et al, 1963 uncited).

CONCLUSION

I leave the conclusion to another author, who sums up the benefits of *Portulaca oleracea* as follows: “Due to its high content of nutrients, especially antioxidants (vitamins A and C, α -tocopherol, β -carotene, glutathione) and omega-3 fatty acids, and its wound healing and antimicrobial effects as well as its traditional use in the topical treatment of inflammatory conditions, purslane is a highly likely candidate as a useful cosmetic ingredient. Since most of the reported effects of purslane are due to its fresh juice or to its decoction, water extractives would be most suitable”. [Leung & Foster, 1996].

REFERENCES

Boulos, Loutfy: Medicinal Plants of North Africa. 1983. Reference Publications, Algonac, Michigan. ISBN No. 0-917256-16-6.

Boulos, Loutfy and el Hadidi, M. Nabil: The weed flora of Egypt. The American University in Cairo Press. 1984. ISBN No. 977-424-038-3.

Bown, Deni: The Royal Horticultural Society. Encyclopaedia of Herbs and their uses. Dorling Kindersley Book. 1995. ISBN No. not given. CN 5672.

Burkill, H.M.: The useful plants of West Tropical Africa. Edition 2. Vol. 4. Families M-R. Royal Botanic Gardens Kew. 1997. ISBN No.1-900347-13-X.

Carrington, Sean: Wild plants of the eastern Caribbean. 1998. Macmillan Education, London and Basingstoke. ISBN No. 0-333-67443-X

Chiej, R.: The Macdonald Encyclopaedia of Medicinal Plants. 1984, reprinted 1988. Macdonald Orbis. ISBN No. 0-356-10541-5 (hb), -10542-3 (pb).

Choi Byung Don, Ryeom Kon, Screening of antitumor activity from the crude drugs in Korea. Korean Journal of Pharmacognosy, 2000,31,1,16-22, Korea Republic,5C00605,Ko,en, 20 ref. Department of Microbiology, Dankook University, Cheonan 330-714, Korea Republic.

Coffey, Timothy: The History and Folklore of North American Wildflowers. 1993. Facts on File. ISBN No. 0-8160-2624-6.

Cowper, A. Portulaca oleracea, purslane. Australian Journal of Medical Herbalism (1996) 8(1): 28. [English, 1 pl.] [3 Short Street, Morisset, NSW 2264, Australia.]

Culpeper, N.: Culpeper's Complete Herbal - a book of natural remedies for ancient ills. 1995. Wordsworth Reference Editions Ltd. ISBN No. 1-85326-345-1.

Drury, Colonel Heber: The useful plants of India; with notices of their chief medicinal value in commerce, medicine and the arts. Higginbotham and Co. Madras. 1873. ISBN No. not available.

Foster, S. & Duke, James A.: Eastern/Central Medicinal Plants. Peterson Field Guides. 1990. ISBN No. 0-395-35309-2 also 0-395-46722-5 (pbk). Houghton Mifflin.

Grieve, Maud: A Modern Herbal – the medicinal, culinary, cosmetic and economic properties, cultivation and folklore of herbs, grasses, fungi, shrubs and trees with all their modern scientific uses. 1998 Tiger Books International, London. ISBN No.1-85501-249-9.

Herbalist, The: newsletter of the Canadian Herbal Research Society. COPYRIGHT June 1988.

Iwu, Maurice M.: Handbook of African Medicinal Plants. CRC Press. 1993.
ISBN No. 0-8493-4266-X.

Jayaweera, D.M.A.: Medicinal Plants used in Ceylon Part 4. National Science Council of Sri Lanka. Colombo 1982.

Kamil, M.; Chan, K.; Habibullah, M.: A review on *Portulaca* species -- with special reference to *Portulaca oleracea*. Department of Pharmacognostical Sciences, Zayed Complex For Herbal Research & Traditional Medicine, Ministry of Health, Abu Dhabi, United Arab Emirates. Australian Journal of Medical Herbalism, **12**, 2, p.43-48, (2000). SN- 1033-8330.

Keys, D.: Chinese Herbs - Their Botany, Chemistry and Pharmacodynamics. 1976 (1990 in paperback) Charles E. Tuttle. ISBN No. 0-8048-1667-0.

Lanska, Dagmar: The Illustrated Guide to Edible Plants. Chancellor Press. 1992.
ISBN No. 1-85152-117-8.

Lavender, Susan and Franklin, Anna: Herb Craft – A guide to the shamanic and ritual use of herbs. Capall Bann Publishing, Chieveley, Berks. 1996. ISBN No. 1-898307-57-9.

Leung, A.Y. and Foster, Steven: Encyclopedia of Common Natural Ingredients used in food, drugs and cosmetics. 2nd. edition. John Wiley 1996 ISBN No. 0-471-50826-8.

Leyel, C.F.: Herbal Delights. 1987 Faber and Faber. ISBN 0-571-14850-6.

Loewenfeld, Claire & Back, Phillipa: Britain's Wild Larder. David & Charles Inc., North Pomfret, Vermont, USA. ISBN No. 0-7153-7971-2 undated.

Low, Tim: Australian Nature Fieldguide. Wild Food Plants of Australia. Angus & Robertson. 1991. ISBN No. 0-207-16930-6.

Maiden, J.H.: The useful native plants of Australia (including Tasmania). Trubner & Co., Ludgate Hill, London. Turner and Henderson, Sydney. 1889. ISBN No. not available.

Nadkarni, K.M., Nadkarni, A.K.: Indian Materia Medica - with Ayurvedic, Unani-Tibbi, Siddha, Allopathic, Homeopathic, Naturopathic and Home remedies. Vol.1. 1999. Popular Prakashan Private Ltd., Bombay, India. ISBN No. 81-7154-142-9.

Oh KiBong; Chang IlMoo; Hwang KiJun; Mar WoongChon: Detection of antifungal activity in *Portulaca oleracea* by a single-cell bioassay system. Natural Products Research Institute, Seoul National University, Seoul 110-460, Korea Republic. Phytotherapy Research, **14**, 5, p.329-332. (2000). SN- 0951-418X|

Quisumbing, Eduardo: Medicinal Plants of the Philippines. Katha Publishing Company. JMC PRESS, Quezon City, Philippines. 1978. ISBN No. unknown.

Reid, Daniel P.: Chinese Herbal Medicine. Shambhala (Boston) 1993. ISBN NO. 0-87773-397-X and ISBN No. 0-87773-398-8 (paperback).

Sakai, N; Inada, K; Okamoto, M; Shizuri, Y; Fukuyama, Y. Portuloside A, a monoterpene glucoside, from *Portulaca oleracea*. *Phytochemistry* (1996) 42(6): 1625-1628. [Institute of Pharmacognosy, Faculty of Pharmaceutical Sciences, Tokushima Bunri University, Yamashiro-cho, Tokushima 770, Japan.]

Scully, Virginia: A treasury of American Indian Herbs - their lore and their use for food, drugs, and medicine. Bonanza Books, New York. 1970. ISBN No. 0-517-140292.

Seaforth, C.E.; Adams, C.D.: A guide to the medicinal plants of Trinidad and Tobago. Revised version. Commonwealth Secretariat, Pall Mall, London. 1985. No ISBN number.

Seaforth, C.E.: Natural products in Caribbean folk medicine. The University of the West Indies. 1988. No ISBN number.

Urban, Anne: Wild Flowers and Plants of inland Australia. 1990. Portside Editions, Australia. ISBN No. 0-9493-1803-5.

Watt, John Mitchell and Breyer-Brandwijk, Maria Gerdina: The Medicinal and Poisonous Plants of Southern Africa – being an account of their medicinal uses, chemical composition, pharmacological effects and toxicology in man and animal. 1932. E&S Livingstone, Edinburgh.

Webb, L.J.: Guide to the Medicinal and Poisonous Plants of Queensland. Bulletin No. 232. Commonwealth of Australia. Council for Scientific and Industrial Research. Melbourne 1948.

Williamson, Jessie: Useful plants of Malawi. (Originally printed as the Useful plants of Nyasaland in 1956), reprinted with corrections date unknown. The Government Printer, Zomba, Malawi. No ISBN No.

Woodward, Penny: An Australian Herbal - A practical guide to growing and using herbs in Temperate Australia and New Zealand. Hyland House. 1990. ISBN No. 0-908090-92-7.

World Health Organisation (WHO) Regional Publications: Western Pacific Series No.3. Medicinal Plants in Viet Nam. 1990. Institute of Materia Medica, Hanoi. 1990. ISBN No. 92-9061-101-4.

Wyk, Ben-Erik van and Gericke, Nigel. People's plants - a guide to useful plants of southern Africa. Briza Publications, Pretoria, South Africa. First edition 2000. ISBN No. 1-875093-19-2.