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Review articles

European and Oriental mistletoe: From mythology to contemporary integrative cancer care

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Abstract

Medical uses of European mistletoe (*Viscum album* L.) and Oriental mistletoe (*Viscum cruciatum* Sieb.) have been common since early times, included cancer therapy. The two mistletoes are mentioned in Classical sources (e.g. Dioscorides and Pliny) and by medieval European practitioners (e.g. Paracelsus) and Arab physicians (e.g. al-Kindi, al-Ghafiqi, and Ibn al-Baytar). These plants are also known as symbols of love and feature in legends throughout ancient and modern Europe. Contemporary traditional medicine uses of mistletoes are found in Lebanon, Israel, Egypt, Turkey, and Pakistan.

In 1916, Rudolf Steiner mentioned for the first time mistletoe extracts as possible for cancer therapy. *V. album* has gained notable attention due to its central role as leading remedy in cancer care in Anthroposophic medicine.

Contrary to the abundance of studies on *V. album*, there is lack of clinical trials concerning anti-cancer activities of *V. cruciatum*. We conclude a discrepancy between the paucity of research data concerning *V. cruciatum* and its attributed efficacy as suggested in historical and ethno-botanical literature. Thus, based on the significant findings achieved in *V. album* research, we recommend targeting research on the therapeutic potential of *V. cruciatum* in cancer care.

Keywords: *Viscum album*; *Viscum cruciatum*; Oncology; Cancer; Islamic medicine; Anthroposophic medicine

Prologue

Viscum album (known as mistletoe) is an important medicinal herb rooted in traditional Middle Eastern and European pharmacopeia. Its use at a modern oncology center, as illustrated by Dr. N's integrated chemotherapy and *Viscum* treatment, is not self-evident and illumines the major change that has occurred in the last three decades regarding herbal medicine: progression from anecdotal myth and documented historical accounts to contemporary evidence-based modern care. Our article focuses on historical and ethno-botanical knowledge of two mistletoes that grow in southern and central Europe (European mistletoe, *V. album* L.) and in the Middle East (Oriental mistletoe, *Viscum cruciatum* Sieb.). Our purpose is to encourage open-mindedness to the potential of traditional herbs in modern cancer care and research.

Botanical perspective

Mistletoe is a semi-parasitic evergreen shrub, with 70 known kinds (Family Viscaceae [Loranthaceae]) in the world, most of them tropical [1]. Mistletoes are widespread around the Mediterranean basin.

V. album L. (European [common, white-berry] mistletoe) is the most common *Viscum* species used in medicine. It is an evergreen parasitic plant, growing on branches of trees where it forms pendant bushes. It is found on various deciduous trees, mainly ash, hawthorn, lime, larch, cedar of Lebanon, and rarely oak or pear. It grows throughout southern and central Europe and eastward to the Caucasus [2]. The genus name is the Latin name of the plant, as it was widely known in Europe; it also

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means birdlime [1]. *V. cruciatum* Sieb. Ex Boiss. (Oriental [redberry] mistletoe) is a perennial, dioecious hemi-parasitic plant with pistillate flowers that produces red berries. It grows sporadically around the Mediterranean (Israel, Jordan, N. Africa, southern Portugal, south-west Spain, Australia, and Asia). Its hosts are in the first place olive, but also almond, lemon, buckthorn, azerolier, and blackberry [3].

Historical perspective

The medical uses of the mistletoes are common since early times. In Classical times Dioscorides (1st century CE) described the *Ixos*, which was identified with white mistletoe (*V. album*), and listed its medical uses: to treat swellings, to soothe, to eliminate pus, to cure stomach ulcers, to treat problems of the spleen, and to remove stones from the urinary tract [4]. Pliny (1st century CE) describes mistletoe and the methods of making birdlime out of it, as well as the superstitions about it of the Gauls, including its worship on the fifth day of the moon (the day their month and year begin) [5]. Paracelsus (15th century) and Matthiolus (16th century) mention mistletoe for the treatment of epilepsy [6].

The tradition of "kissing under the mistletoe" originated in Scandinavian legend. Bakder, the god of peace, was killed by an arrow made of mistletoe and was resurrected by the other deities. Common mistletoe was then entrusted to the goddess of love, who established it as a symbol of love; it was customary that anyone passing beneath it should receive a kiss [1]. A festival in honour of the mistletoe, called Guilanlen, was celebrated in France as late as the 16th century; in England the plant is still hung in the room at Christmas [6].

Common mistletoe was deemed sacred in pre-Christian Europe (Gaul, Britain and Ireland). It was considered as Druidic herb, associated with welcoming the New Year (the original Golden Bough). It was cut only from oak trees by Druids in white robes at a particular phase of the moon, using golden sickle (along with the sacrifice of victims and the fasting of devotees) [1,6]. Thus obtained, the plant was considered a cure-all, a charm against disaster and the emblem of fertility. As such it was a special object of worship among ancient Britons, who named it with various superlatives, some of which exist to the present day in Welsh [6].

In German folklore mistletoe bestows the power to see ghosts and make them speak. In traditional European medicine it was believed that the medicinal uses of the common mistletoe varied according to the host tree; the Druids held mistletoe on oak supreme (probably compounds that effect protein synthesis, and benefit the immune and circulation systems and the heart) [1].

Common mistletoe (*V. album*) has a pungent, bitter-sweet taste, and is a warming herb that lowers blood pressure, stimulates the immune system, slows heart beat, relaxes spasms, and has sedative, diuretic, and anti-cancer effects. The plant is used internally, for mild hypertension, hardening of the arteries, nervous tachycardia, nervous tension, and cancer (mainly of lung and ovaries). Externally the common mistletoe is used for arthritis, rheumatism, chilblains, leg ulcers, and varicose veins. It is also used for the treatment of mild hypertension (with *Cartaegus laevigata* and *Mellisa officinalis*) and hardening of the arteries (with *Ginkgo biloba* and *Vinca major*) [1].

The medicinal uses of mistletoe in the middle ages

Many authors of Arabic medical books mention mistletoe (*bantumah, dibq, shagar ed dibq, zarq et tayr* in Arabic) identified in various dictionaries as *V. album* [7–10]. But this plant does not grow in the Middle East. We suggest that the plant used by the medieval Middle Eastern physicians, herbalists and pharmacologists was the local *V. cruciatum*; in those times they often could not differentiate species of the same genus, so many names were collective [11].

These sources also describe mistletoe's nature and various uses, including medicinal. It was used as laxative and a solvent of corrupt humours, to cleanse the system of adust bile and phlegm (with walnuts and castor oil) and remove obstructions, and as a remedy for lumbago and piles. Applied externally, it was used to promote suppuration, or cause dispersion of tumours or enlargements [6].

According to al-Kindi (9th-century Iraqi physician), the mistletoe resin was a medication for mouth cancer, tooth decay, and stomach ulcers [10].

al-Ghafiqi (12th-century Andalusian physician) described the use of the plant to knit broken bones (drunk with Armenian clay); its decoction prevented cough. This author noted that it was a bitter and constricting drug [12].

Ibn al-Baytar (13th-century Spanish physician, specialist in medicinal plants of the Levant) notes in his book on medicinal substances that the plant grew in Andalusia and in the Levant (al-Sham region), especially in the area of Shechem ("Nablus"), where they customarily fried the fruit in olive oil to improve its colour. Ibn al-Baytar also claimed that the plant grew mainly on olive, almond, and pear trees. He cited various physicians who listed the medical properties and uses of the plant; they included knitting broken bones and treating cracks in the skin, torn muscles, cough (boiled with figs), and skin diseases. In his view the plant was cold, constricting, and dry [13,14].

The Jewish physician R. Nathan Ben Yoel Falaqera (13th century, Spain), wrote in his book *Sori Ha-Guf* that the fruit is black and as small as peas. It is a hot and dry drug, used to treat the joints and bad nails [15].

According to Daud al-Antaki (16th-century Turkish physician) and known physicians that he mentioned, mistletoe is a cold, dry and astringent drug, and rather bitter. It healed damaged muscles, treated blood spitting, opened obstructions, cleansed the mind and the stomach, knitted fractures, cured cough and skin diseases, and dried haemorrhoids [16].

By the 18th century the medical use of *V. album* had become widespread in Europe and was associated with superstitious and magical practices [17–20]. In the 19th century several physicians in Europe and the USA started to study the plant and its medicinal uses with modern tools, and thereafter used it in various forms to treat, among other things, menorrhagia and post-partum haemorrhage, and as a substitute for digitalis. The active materials of