

Legal Use of Potentially Poisonous Plants: The Case of British Herbalism

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Introduction

This note aims to highlight the common and safe medicinal use of herbs and herbal products within professional British herbal medicine otherwise considered “poisonous”, and to provide a brief history of their use, an overview of their history of regulation, a list of the herbs used, their dosages, and key uses. Due to potential toxicity, some pharmacologically active whole plants with a narrow therapeutic window are generally considered to be rarely or no longer used in European pharmaceutical, folk, or professional herbal medicine (Fałkowska et al. 2018; Fatur and Kreft, 2021). Although some compounds, such as hyoscyamine and atropine, are used in conventional medicine, and some plants are used in other healing modalities such as Ayurveda, this contrasts with European use (Maheshwari et al. 2013; Navasi et al. 2019). Examples include lily-of-the-valley (*Convallaria majalis* L.) and a range of Solanaceae members such as jimsonweed (*Datura stramonium*, L.), belladonna (*Atropa bella-donna* L.), and henbane (*Hyoscyamus niger* L.) (Hedley and Shaw, 2023). However, in the case of British medical herbalists, these herbs continue to be actively prescribed and used as medicines, although in regulated and restricted ways. It has been noticed by the authors of this note that in ethnobotany lectures and publications this significant British use is overlooked in relation to these plants, likely because of a belief in their toxicity and

a distinct lack of academic writing and research on the subject.

Information on these medicinal herbs as used by herbalists is not widely published, except in historical texts (for example, see Bevan-Jones, 2009). The current method of sharing this knowledge in the profession is from teacher to student, alongside a few monographs that appear in larger works (Bone and Mills 2013; Hedley and Shaw 2023; Hoffman 2003). A collected and centralized published and peer-reviewed work on these herbs has not been done. Therefore, the breadth and depth of the use of these herbs is not well known outside of the British profession of herbal medicine. One previous paper by Denham (1999) addressed the herbs’ use under older legislation. Other studies only mention single herbs, such as *Chelidonium majus* L. (Gilca et al. 2010; Teschke et al. 2011), or are limited to use, for example, in the doctoral thesis by Peintner (2021) on the herbal treatment of Parkinson’s disease. There is, however, a forthcoming study, which will report on the results of a survey of herbalists recording their use of Schedule 20 s (Etheridge 2024 pers. comm.).

In the UK, the medicinal use of these plants by medical doctors and herbalists is regulated by the Human Medicines Act (2012) Schedule 20 Part 2 (UK Legislation, 2012), known as the “Schedule 20” herbs. A further set is limited in dosage by mutual agreement between members of the professional members associations (e.g., the National Institute of Medical Herbalists [NIMH] and College of Practitioners of Phytotherapy [CPP]) and are commonly known as the Restricted Herbs. The main author was trained as a medical herbalist and moved into the field

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of ethnobotany where it has been personally observed that knowledge of British herbal use of these plants is not well known.

Methodology

The little literature that has been published as well as unpublished literature used by Herbal Medicine Schools on the topic of these herbal medicines was reviewed and collated into a tabular format covering dosages, ratios (of dried herb in grams to ml of liquid) and key uses. Information for Tables 1, 2, 3, and 4 was gathered from Denham (1999), UK Legislation (2012), Fletcher-Hyde (1978), Grieve (1971), Hedley and Shaw (2023), Bone and Mills 2013, and NIMH (2022), as well as through personal experience from herbal school teachings and non-published teaching documents used in mainstream herbalist training programs in the UK.

Schedule 20 Herbs and a Brief History of British Herbal Law

In Britain, the practice of herbalism has been historically protected by an Act of Parliament: The Herbalist's Act, 1542, commonly known as the Herbalist's Charter (34 and 35 Hen. 8. c. 8) (MacLennan and Pendry 2011a; McIntyre 2005). This emerged during a period when a growing distinction between conventional and herbal medicine was formalized by the chartered establishment of the Royal College of Physicians in 1518. King Henry VIII was an instrumental force in the protection of herbalists, having his own interest in health, herbs, and medicine making (Drieshen 2020; O'Sullivan 2005; Waddell, 2016). Although the Herbalist's Act has since been repealed by other legislation, its existence acts as an interesting starting point for discussion to understand the way in which herbal medicine is freely practiced in Britain compared to other countries, and why herbalists are now permitted to use certain herbs that are otherwise regulated by medical law.

This 1542 Act was eventually repealed by another, The Medicines and Pharmacy Act (1941) (UK legislation 1941), which regulated in Sect. 12 that the dispensation of pharmaceuticals by authorized medical practitioners (e.g.,

pharmacists, dentists). In essence, this meant that herbs could no longer be dispensed by herbalists. However, it was once again permitted by The Medicines Act (1968) (Fletcher-Hyde 1978; MacLennan and Pendry 2011b; Newall 1998; O'Sullivan 2005; UK legislation 1968). The Act was brought into being as a result of the Thalidomide tragedy, whereby its untested prescription for morning sickness in pregnancy had led to thousands of children born with significant limb deformation (Teff 1984). However, during the subsequent development of regulation, it was recognized by NIMH that it would challenge herbal medicine practice. An exemption for herbalists was established through consultation with NIMH president, chemist, and herbalist, Fred Fletcher Hyde (MacLennan and Pendry 2011b; Robbins 1994).

The Act's exemption was listed under Sects. 12 – "Exemptions in respect of herbal remedies," which stipulated that herbalists could dispense herbs after an in-person consultation (Denham 1999; MacLennan and Pendry 2011b; Robbins 1994). In addition, Prescription Only Medicines (POMs) were also defined, and this regulated the dispensing of drugs (and their associated whole herb) of potentially hazardous nature to prescription only by a doctor or other registered medical professionals (and, therefore, not by herbalists). Examples include morphine from the opium poppy (*Papaver somniferum* L.) (which had already been regulated by the Dangerous Drugs Act 1920–25) and digoxin and digitoxin from purple foxglove (*Digitalis purpurea* L.) (Ferner and Aronson 2023; Newall 1998).

Later, The Medicines (Retail and Supply of Herbal Remedies) Order 1977 regulated the use of some potentially toxic herbs under stipulated maximum strengths and dosages of the herbs (called the Schedule III herbs) (Ferner and Aronson 2023; MacLennan and Pendry 2011a, b; UK Legislation 1977; Waddell 2016).

The Human Medicines Regulations 2012, (Part 12, Chapter 3, Regulation 241) superseded this act and again outlined restrictions on herbs previously on Schedule III on an updated list called Schedule 20, which can be seen in Tables 1 and 2. This is the legislation which regulates the use of these herbs today. These herbs are dispensed by herbalists as tinctures (alcoholic extracts). Their dosages, given as mg on the legislation, have been

TABLE 1. SPECIES, PARTS, USES, AND MAXIMUM DOSE OF TINCTURED SCHEDULE 20 HERBS (INTERNAL USE) (BONE AND MILLS 2013; DENHAM 1999; FLETCHER-HYDE 1978; GRIEVE 1971; HEDLEY AND SHAW 2023; NIMH 2022; UK LEGISLATION 2012)

Botanical name + family	Common name	Parts used	Single max dose (mg of herb)	Dried tincture ratio	Max weekly dosage	Key uses
<i>Adonis vernalis</i> L. Ranunculaceae	Pheasant's eye	Aerial parts	100 mg	1:10	21 ml	Certain cardiovascular conditions including cardiac insufficiency
<i>Aspidosperma quebracho-blanco</i> Mart. & Zucc Apocynaceae	Quebracho	Dried bark	50 mg	1:5	5 ml	Antispasmodic for certain respiratory conditions, e.g., asthma and bronchitis
<i>Atropa bella-donna</i> L., <i>Atropa acuminata</i> Royle ex. Lindl Solanaceae	Deadly night-shade	Aerial parts	50 mg	1:10	10.5 ml	Sedative, antispasmodic, CNS depressant. Used predominantly in the Gastrointestinal tract (e.g., colic, gastritis, IBS), but also for asthma and for urinary spasm. Parkinson's Disease Topically for pain including neuralgia, arthritis, broken bones Menopausal flushes, drying secretions, insomnia
<i>Atropa belladonna</i> L., <i>Atropa acuminata</i> Royle ex. Lindl Solanaceae	Deadly night-shade	Root	30 mg	1:10	6 ml	As above, but usually used externally as an analgesic for musculoskeletal pain and hemorrhoids
<i>Chelidonium majus</i> L. Papaveraceae	Greater celandine	Aerial parts	2 g	1:5	210 ml	Cholagogue, diuretic, antimitotic. In certain liver and gall-bladder conditions. Gynecological conditions, including endometriosis and fibroids. Dermatological issues, including warts and verrucae. The maximum weekly dosage is further restricted by agreement among herbal associations to 50 ml per week
<i>Cinchona</i> spp. L. Rubiaceae	Quinine / Fever tree	Bark	250 mg	1:10	52.5 ml	Antiparasitic, astringent. Malaria, autoimmune conditions, anorexia
<i>Colchicum autumnale</i> L. Colchicaceae	Autumn flowering crocus	Corm	100 mg	1:10	21 ml	Anti-inflammatory, joint inflammation and pain such as in gout

Table 1. (continued)

Botanical name + family	Common name	Parts used	Single max dose (mg of herb)	Dried tincture ratio	Max weekly dosage	Key uses
<i>Convallaria majalis</i> L. Asparagaceae	Lily of the valley	Leaves	150 mg	1:8	25 ml	Cardiotonic. Cardio-vascular conditions such as heart failure, angina
<i>Datura stramonium</i> L. Solanaceae	Thorn apple, jimson weed	Aerial parts	50 mg	1:10	10.5 ml	Sedative, antispasmodic, mucolytic. Used predominantly in the respiratory system (e.g., asthma and convulsive coughs) Parkinson's spasm
<i>Ephedra sinica</i> Stapf Ephedraceae	Ma Huang, ephedra	Young stems	600 mg	1:4	50 ml	Sympathetic nerve stimulant, antispasmodic. Respiratory issues (e.g., asthma and allergic rhinitis)
<i>Gelsemium sempervirens</i> (L.) J.St.-Hil Gelsemiaceae	Yellow jasmine	Root	25 mg	1:10	5 ml	Analgesic, sedative, depresses the central nervous system. Used specifically in trigeminal neuralgia as well as chronic pain, and nerve pain, particularly oral/dental
<i>Hyoscyamus niger</i> L. Solanaceae	Henbane	Aerial parts	100 mg	1:10	21 ml	Sedative, antispasmodic. Used in urinary spasm, incontinence, asthma, and whooping cough
<i>Lobelia inflata</i> L. Campanulaceae	Puke weed	Aerial parts	200 mg	1:8	33.5 ml	Antispasmodic in respiratory issues such as asthma, bronchitis, emphysema, intercostal myalgia Nicotine addiction

converted to tincture dosage per week in ml and ratio of extraction (grams of herb to ml of alcohol). The herbs are rarely dispensed in other ways, but this is little studied. In the first authors’ experience of the industry—due to safety considerations regarding consistency in batch and therefore dosage—the tinctures are usually bought from established professional suppliers. The suppliers usually require certification of training before sale. However, it is known that a very few herbalists sometimes make some of their own where there is herbal

availability, such as for locally native or easily cultivated e.g., *Chelidonium majus*. Figure 1 shows examples of tinctures (alcohol-based extracts) bought and used by herbalists.

Part I of the schedule contains a list of herbal parts prohibited for various reasons, often due to their toxicity, such as mistletoe berry (*Viscum album* L.) (European Food Safety Authority 2009). Other herbs are regulated in form, such as pomegranate bark (*Punica granatum* L.), which is considered genotoxic (Sánchez-Lamar et al. 2008), and slippery elm bark (*Ulmus rubra*

TABLE 2. SPECIES, PARTS, USES, AND MAXIMUM DOSE OF TINCTURED SCHEDULE 20 HERBS (EXTERNAL USE) (BONE AND MILLS 2013; DENHAM 1999; FLETCHER-HYDE 1978; GRIEVE 1971; HEDLEY AND SHAW 2023; NIMH 2022; UK LEGISLATION 2012)

Botanical name+ family (no need to learn authority)	Common name	Part used	Maximum percent concentration	Key uses
<i>Aconitum napellus</i> L. Ranunculaceae	Aconite, Monk’s hood	Dried Root	1.3%	Analgesic. Topically on unbroken skin for tingling, numbing pain (e.g., sci- atica, osteoarthritis, rheumatoid arthritis, facial neuralgia)
<i>Conium maculatum</i> L. Apiaceae	Poison Hemlock leaf	Aerial parts	7%	Analgesic, antipruritic. Topically for pain (e.g., hemorrhoids, anal fissure)
<i>Pilocarpus jaborandi</i> Holmes Rutaceae	Jaborandi	Leaflets	5%	Alopecia
<i>Toxicodendron pube- scens</i> Mill. (syn. <i>Rhus toxicodendron</i> L.) Anacardiaceae	Poison oak (also seen named as poison ivy in texts)	Leaves	10%	Dermatology

Muhl.), which is legally available as a powder, but not in whole forms due to rolled bark, known as “quills,” being associated with illegal abortion.

Part II lists herbs that may be prescribed by an herbalist after consultation in defined dosages; they must be labeled appropriately and stored securely. A list of the most common species taught and used by herbalists can be found in Tables 1 and 2. The official list in Part II of the act describes more species variety than commonly used by herbalists; the most common species are those shown in the tables of this note. It should be noted that many of these herbs have strict contraindications and cautions not listed here due to this article remit and space.

What the act does not define, however, is what an herbalist is. Therefore, in an interesting legal loophole, anyone in the UK calling themselves an herbalist could legally use and prescribe these herbs, although in practice, suppliers are unlikely to sell to those without training.

In addition, it is important to note there are other herbs legally restricted due to further

legislation which were previously used. The Medicines for Human Use (Prohibition) (Senecio and Miscellaneous Amendments) Order 2008 banned the use of herbs considered too toxic for use, including ragwort (*Senecio* spp., L. which was little used anyway), *Aristolochia* spp. (Mu Tong), and kava kava (*Piper methysticum* G.Forst), although the latter is allowed for external use and is listed under the restricted herbs list (see next section) (UK Legislation 2008). An interesting history of herbal use and the kava kava controversy can be found in Whitton et al. (2003). A visual overview of the timeline of the key regulations as discussed above can be seen in Fig. 2.

The “Restricted” Herbs

In addition to the above Schedule 20 herbs as defined in law, there are further herbs that are used by herbalists under no legal regulation. However, due to safety, they are restricted in dosage and application by mutual agreement

TABLE 3. SPECIES, PARTS, USES, AND MAXIMUM DOSE OF TINCTURED RESTRICTED HERBS (INTERNAL USE) (BONE AND MILLS 2013; DENHAM 1999; FLETCHER-HYDE 1978; GRIEVE 1971; HEDLEY AND SHAW 2023; NIMH 2022; UK LEGISLATION 2012)

Botanical name + family	Common name	Parts used	Dried tincture ratio	Maximum weekly dosage	Key uses
<i>Bryonia alba</i> L. (syn. <i>B. dioica</i> Jacq.) Cucurbitaceae	White Bryony	Root	1:10	10.5 ml	Myalgia, rheumatic disease and arthritis Severe respiratory conditions such as pneumonia, bronchitis, pleurisy, whooping cough, and Bornholm disease
<i>Carapichea ipecacuanha</i> (Brot.) L. Andersson Rubiaceae	Ipecac	Root	N/A	1%	Digestive stimulant, diaphoretic, and expectorant actions, particularly useful for coughs
<i>Cytisus scoparius</i> (L.) Link Fabaceae	Broom	Aerial parts	1:5	40 ml	Regulating heart rhythm
<i>Phytolacca</i> spp. (syn. <i>P. decandra</i>) Phytolaccaceae	Poke root	Root	1:5	8 ml	Topical and internal lymphatic for chronic infection and inflammation, swollen glands, mumps, cysts, mastitis, hydroceles
<i>Piscidia piscipula</i> (L.) Sarg. (syn. <i>P. erythrina</i> L.) Fabaceae	Jamaican Dogwood	Bark	1:3	50 ml	Analgesic, antispasmodic. Toothache, neuralgia, migraine, dysmenorrhea, insomnia, nervous exhaustion
<i>Solanum dulcamara</i> L. Solanaceae	Woody Nightshade, Bittersweet	Twigs	1:5	60 ml	Alternative. Sexual overexcitement. chronic skin conditions
<i>Symphytum officinale</i> L. Boraginaceae	Comfrey leaf	Leaves	1:5	*100 ml + max 6 weeks	Vulnerary, demulcent. Legally permitted internally but subject to further restrictions by Professional Herbal Member Associations: some permit, others do not. Dosage limited to 6 weeks

TABLE 4. SPECIES, PARTS, USES, AND MAXIMUM DOSE OF TINCTURED RESTRICTED HERBS (EXTERNAL USE) (BONE AND MILLS 2013; DENHAM 1999; FLETCHER-HYDE 1978; GRIEVE 1971; HEDLEY AND SHAW 2023; NIMH 2022; UK LEGISLATION 2012)

Botanical name + family (no need to learn authority)	Common name	Parts used	Dosage restriction	Key uses
<i>Piper methysticum</i> G.Forst Piperaceae	Kava Kava (NB Internally restricted under legal category SI 3170)	Aerial parts	External use only, dosage not restricted	Antifungal
<i>Symphytum officinale</i> L. Boraginaceae	Comfrey (root)	Root	1:10 (if tinctured) Can make up to 100% of product	On unbroken skin only. Vulnerary. Broken bones, strains, sprains, bruises. Topically the leaf is allowed in any dosage, it is only the root which is restricted to external use only
<i>Arnica montana</i> L. Asteraceae	Arnica	Flos	10%	Vulnerary. On unbroken skin only. Specifically for bruises, strains, and sprains



Fig. 1. An example selection of Schedule 20 tinctures used by British herbalists. Image Author's own

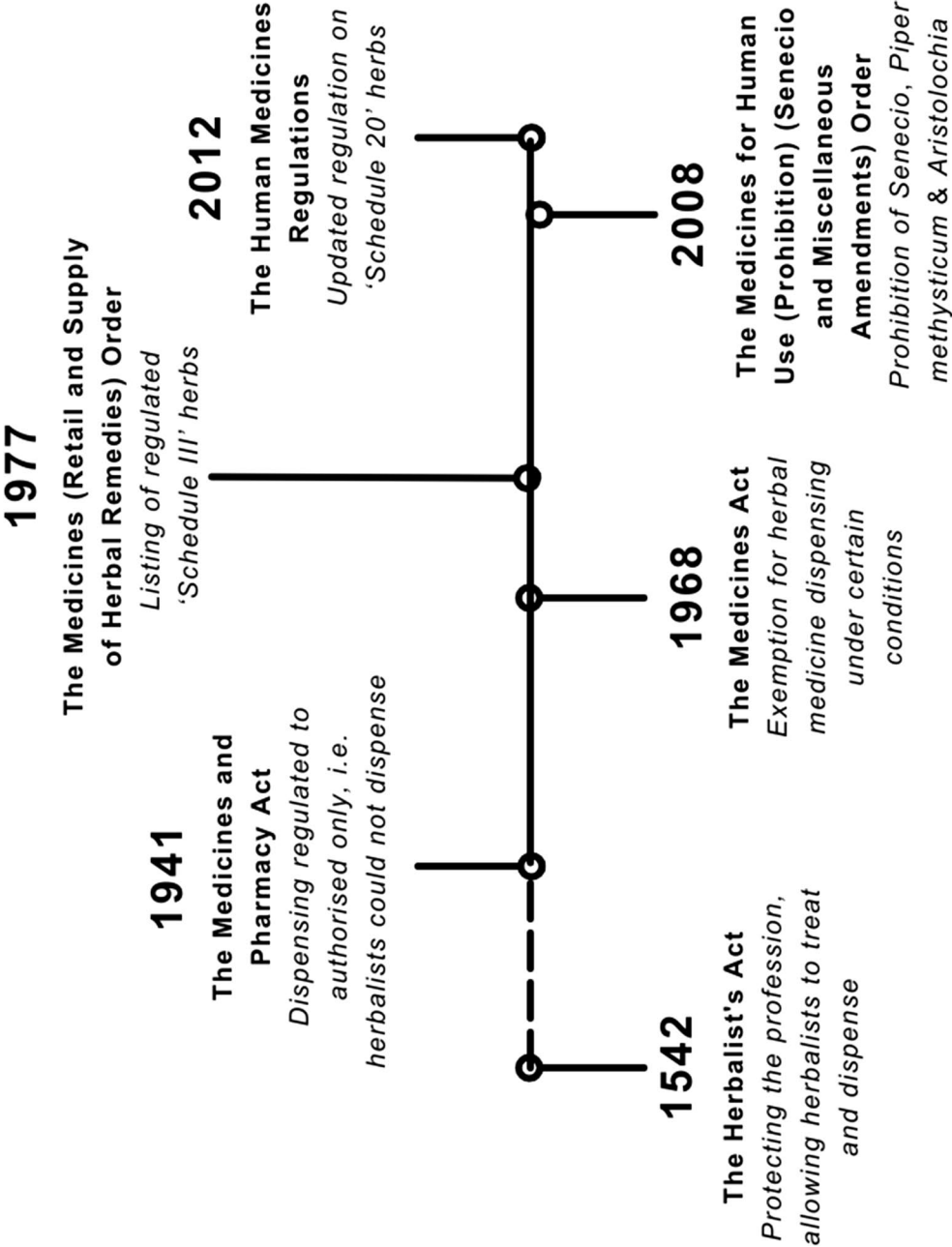


Fig. 2. A timeline showing significant United Kingdom herbal medicine regulations. Created by authors using canva.com

within the herbal profession. The history of the origins of these agreements is little known but include the herbs in Tables 3 and 4. Some of these are widely known within commerce, e.g., *Arnica* creams are a popular treatment for bruises and contain use instructions similar to those given in Table 4. For the others, anyone lacking herbal medicine training may not be aware of these recommended restrictions.

Conclusion

This note aims to raise awareness of a little-known element of British herbal medicinal practice and law within the scope of ethnobotany. These "poisonous" but medicinally effective plants, schedule 20 and restricted herbs, remain in use in British herbal medicine. This information is of use to both researchers in ethnobotany, as well as medical professionals, who may encounter patients in their practice using these plants.

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Declarations

Ethics Approval N/A.

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