



PHYTOMEDICINES,  
**HERBAL DRUGS,**  
*and*  
POISONS

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BEN-ERIK VAN WYK



# PHYTOMEDICINES, HERBAL DRUGS, and POISONS

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Plants have been used to treat disease throughout human history. On a clay slab that dates back approximately five thousand years, the Sumerians recorded medicinal recipes that made use of hundreds of plants, including poppy, henbane, and mandrake. During the Middle Ages, monks commonly grew and prescribed plants such as sage, anise, and mint in their monasteries. And as the market for herbal remedies and natural medicine grows, we continue to search the globe for plants and plant compounds to combat our various ailments.

In *Phytomedicines, Herbal Drugs, and Poisons*, Ben-Erik van Wyk offers a richly illustrated, scientific guide to medicinal and poisonous plants, including those used for their mind-altering effects. Van Wyk covers approximately 300 species—from *Aloe vera* and *Ephedra sinica* to *Cannabis sativa* and *Coffea arabica*—detailing the botanical, geographical, pharmacological, and toxicological data as well as the

chemical structures of the active compounds in each. Readers learn, for example, that *Acacia senegal*, or gum acacia, is used primarily in Sudan and Ethiopia as a topical ointment to protect the skin and mucosa from bacterial and fungal infections, and that *Aconitum napellus*, more commonly known as aconite, is used in cough syrups but can be psychedelic when smoked or absorbed through the skin.

With 350 full-color photographs featuring the plants and some of their derivative products, *Phytomedicines, Herbal Drugs, and Poisons* will be an invaluable reference not only for those in the health care field but also for those growing their own medicinal herb gardens, as well as anyone who needs a quick answer to whether a plant is a panacea or a poison.

**Ben-Erik van Wyk** is professor of botany at the University of Johannesburg. He is the author of *Culinary Herbs and Spices of the World*, also published by the University of Chicago Press.

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***Abrus precatorius***  
crab's eye vine • coral pea



**CLASSIFICATION** Cell toxin (1a); TM: Africa, Asia.

**USES & PROPERTIES** The attractive seeds are used to make necklaces, bracelets and other decorative objects. A highly resistant seed coat ensures that the intact seeds pass harmlessly through the digestive tract. However, when seeds are pierced or damaged, the poison is released, causing dermatitis, intoxication and even death.

**ORIGIN** Africa, Asia.

**BOTANY** Woody climber; leaves pinnate; flowers pale purple; pods 4–5-seeded.

**CHEMISTRY** Abrin (a mixture of four lectins called abrin a–d, in seeds); abrusosides (sweet-tasting triterpene saponins, in leaves and roots).

**PHARMACOLOGY** Abrin: haemagglutinating, inhibitor of ribosomal protein synthesis.

**TOXICOLOGY** Abrin:  $LD_{50} = 0.02$  mg/kg (mouse, i.p.); seeds: lethal dose = 0.5 g (humans, p.o.).

**NOTES** Fatal cases of poisoning are rare.



***Abrus precatorius*** L. (Fabaceae); *pois rouge* (French); *Paternostererbse* (German)

***Acacia senegal***  
gum acacia • gum arabic tree



**CLASSIFICATION** TM: Africa, Europe, Asia (Pharm).

**USES & PROPERTIES** Gum arabic is the tasteless and odourless dried exudate collected from the bark. It is used topically as emollient to promote healing and to protect the skin and mucosa from bacterial and fungal infections. Its main use in pharmacy is as emulsifier, stabiliser of suspensions and additive for solid formulations and tablets.

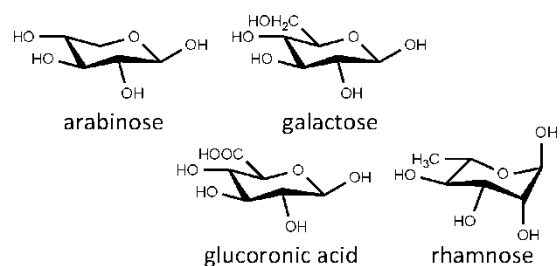
**ORIGIN** Africa. Gum is produced in North Africa and especially in Sudan and Ethiopia.

**BOTANY** Tree (to 6 m); thorns in groups of three; leaves compound; flowers minute, cream-coloured, in elongated spikes; pods flat, oblong.

**CHEMISTRY** Gum arabic is a polysaccharide (MW 270000) with arabinose, galactose, D-glucuronic acid and L-rhamnose subunits.

**PHARMACOLOGY** Moisturising, antibiotic and protective effect on skin and mucosa.

**TOXICOLOGY** Non-toxic (edible).



***Acacia senegal*** (L.) Willd. (Fabaceae); *acacie gomme arabe* (French); *Verek-Akazie* (German); *acacia del Senegal* (Italian)

***Achillea millefolium***  
yarrow • milfoil • woundwort



**CLASSIFICATION** TM: Asia, Europe (Pharm; Comm. E+).

**USES & PROPERTIES** The whole plant (*Millefolii herba*), flowers (*Millefolii flos*) or sometimes the essential oil are used for lack of appetite and minor dyspeptic complaints. Traditional uses include the treatment of arthritis, the common cold, fever and hypertension. Internal use: 4.5 g of the herb per day, as infusion or tincture (or 3 g flowers). External use: 100 g herb in 20 liters of bath water.

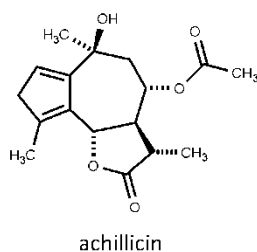
**ORIGIN** Europe and W Asia (widely cultivated).

**BOTANY** Perennial herb; leaves compound, feathery; flowers white to pink.

**CHEMISTRY** Pyrrolidine alkaloids (betonicine, stachydrine), flavonoids and essential oil ( $\alpha$ -pinene, camphor, 1,8-cineole, caryophyllene and blue azulenic compounds released from lactones (e.g. achillicin) during steam distillation).

**PHARMACOLOGY** Antibacterial, anti-inflammatory, antispasmodic; antipyretic, hypotensive.

**TOXICOLOGY** Low toxicity; may cause dermatitis.



***Achillea millefolium*** L. (Asteraceae); *millefeuille* (French); *Schafgarbe* (German); *achillea millefoglio* (Italian); *milenrama* (Spanish)

***Aconitum napellus***  
aconite • monkshood • wolfsbane



**CLASSIFICATION** Neurotoxin (1a); mind-altering; TM (Europe, Asia); MM and homeopathy.

**USES & PROPERTIES** Dilute root tinctures are used in cough syrups and in homeopathy. Higher concentrations (or pure alkaloid) are applied topically to treat rheumatism and neuralgia. Aconite is a psychoactive drug. In India and China, some species are used topically for analgesic, antineuralgic, anti-inflammatory and antipyretic effects. Formerly used for executions, murder, suicide and to control vermin (hence “wolfsbane”).

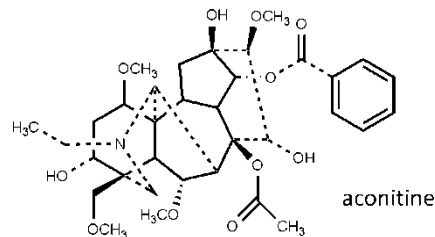
**ORIGIN** Europe (widely cultivated).

**BOTANY** Perennial herb with tuberous rootstock; leaves dissected; flowers with colourful sepals.

**CHEMISTRY** Diterpenoid alkaloids (aconitine).

**PHARMACOLOGY** Aconitine stimulates Na<sup>+</sup>-channels; peripheral nerve endings are first activated and then paralysed. It is strongly psychedelic when smoked or absorbed through the skin.

**TOXICOLOGY** Aconitine: lethal dose 3–6 mg (humans).



***Aconitum napellus*** L. (Ranunculaceae); *aconit napel* (French); *Blauer Eisenhut* (German); *aconito* (Italian); *acónito* (Spanish)