PH-07 South and Southeast Asia: the Ayurvedic, Jamu and Thai materia medica evaluated

HEALING after the FALL, research library, PH-07

Researched 10 October 2026 by Claude Opus agent for THRIVING after the FALL, Book Four. Library document, unverified.

How to read this report

This is the regional report for a reader who lives between the Indus and the Philippines, where the garden holds ginger, turmeric and lemongrass rather than sage and yarrow. It stands alone, but it is written around the home pharmacopoeia (THRIVING library, PH-01) and the account of Ayurveda as a system (THRIVING library, TR-02), which already gives the doshas, the classical texts, the regulation of products and the detail of the heavy-metal studies. I do not repeat those. I add the region's other great traditions, Unani tibb, Jamu and Thai traditional medicine, and test the plants one by one, citing TR-02 where it holds the trial numbers.

For each plant I keep apart what the tradition says, what the record shows and what modern science infers. Grades: A (randomised trials or systematic reviews), B (consistent observational or clinical series), C (convergent use across unrelated cultures with plausible pharmacology), D (one tradition, anecdote or theory), X (shown ineffective or harmful). A grade belongs to the preparation tested, not to the plant (THRIVING library, PH-01).

1. Four traditions on their own terms

1.1 Ayurveda, briefly

Ayurveda understands illness as an imbalance of the three doshas, vata, pitta and kapha, treated by diet, regimen, cleansing and medicines chosen by taste and potency (THRIVING library, TR-02). Two features matter here. Ayurveda contains rasa shastra, the branch that prepares metals and minerals as bhasma (calcined ashes), and the mercury, lead and arsenic findings belong to it. And the classical pharmacy includes deliberately poisonous plants, among them Strychnos nux-vomica (kuchla), Aconitum ferox (vatsanabha) and Abrus precatorius (gunja), which the texts say must first pass through shodhana, a purification. Section 6 deals with those.

1.2 Unani tibb in India

Unani ("Greek") medicine came to India with Persian and Arab physicians and is now one of the state-recognised AYUSH systems, with its own colleges and hospitals (Vikaspedia n.d., AYUSH Delhi n.d.). On its own terms the body holds four humours: dam (blood), balgham (phlegm), safra (yellow bile) and sauda (black bile). Each person has a mizaj, a temperament hot or cold, wet or dry, and so does each disease and each drug. Health is kept by six essentials, the asbab-e-sitta zaruriya: air, food and drink, movement and rest, mental activity and rest, sleep and waking, and retention and evacuation. Illness is treated by opposites through four modes: regimen (ilaj bil tadbeer), diet, drugs and surgery (Vikaspedia n.d., Britannica n.d.). The system descends from Hippocrates and Galen through Ibn Sina,

and its materia medica overlaps with Ayurveda's: both give unripe bael for diarrhoea. I found no systematic review of a Unani preparation.

1.3 Jamu in Indonesia

Jamu is the herbal medicine of the Javanese, practised across Indonesia. UNESCO inscribed "Jamu wellness culture" on its Representative List in December 2023, describing a practice dating from at least the eighth century, carried mostly by women and handed down in families (UNESCO 2023). The word is traced to Old Javanese djampi, healing with herbs or prayers, and oesodo, health (Elfahmi et al. 2014, abstract). The Surakarta court manuscript Serat Kawruh bab Jampi-jampi Jawi, compiled in 1831 or 1833 (sources differ), is said to hold 1,166 recipes, 922 of plants and 244 of rajah and jimat, written charms and amulets (Google Arts and Culture n.d., Umbara n.d.). One source gives this split for the Serat Centhini instead [VERIFY]. The charms belong to the Javanese court and the families who hold them. This report says they exist and does not reproduce them (THRIVING library, SY-04).

The everyday illness of Jamu is masuk angin, "wind entering". In Javanese hot and cold thinking, as the Gadjah Mada anthropologist Atik Triratnawati describes it, wind enters a body weakened by fatigue, night air or rain and brings aching, bloating, chill and malaise. Indonesians say it is not a cold. It is treated by kerokan, scraping the back with a coin and oil until red streaks rise, by massage and by warming jamu of ginger and its relatives (UGM n.d., Anggoro and Jee 2021 [VERIFY authors]). Postpartum jamu is widely used by Javanese mothers (postpartum jamu review, search summary [VERIFY]).

Indonesian law sorts products into three tiers: jamu, resting on traditional use, obat herbal terstandar (standardised, tested in animals) and fitofarmaka (clinically tested) (Elfahmi et al. 2014). The Ministry of Health's saintifikasi jamu programme has produced twelve scientific jamu formulas (Universitas Padjadjaran n.d., search summary). Elfahmi, Woerdenbag and Kayser conclude that efficacy and harm remain to be shown.

1.4 Thai traditional medicine

Thai traditional medicine holds that the body is built of four elements, dhatu: earth, water, wind and fire. Earth has twenty components, water twelve, wind six and fire four, forty-two in all, and disease is the disorder of one or more (Vallisuta n.d., citing the royal compendium of 1923). The healer weighs element, age, season and time of day. To about 15 the body is ruled by semha (phlegm), from 16 to 30 by pitta, and over 30 by vata (wind), when fatty and bitter herbs, Plai (Zingiber cassumunar) among them, are given (Vallisuta n.d.). The common phrase for being ill is pen lom, "it is the wind". Massage rearranges the elements, and in 1836 King Rama III commissioned eighty statues of hermits in self-massage postures for Wat Pho in Bangkok (Matics n.d.). Between 1831 and 1841 medical texts were carved into the temple: 608 of 1,431 inscribed slabs carry medicine (MOWCAP n.d.).

Thailand has tested and listed its own plants. The National List of Essential Medicines carries Andrographis, Plai cream, turmeric and ginger beside drugs, and Plai was prescribed about 3.73 million times in one recent year (Asia News Network 2026, news report). Many of the best trials below were run by Thai physicians testing their own tradition, notably Visanu Thamlikitkul and colleagues from 1989 onwards.

2. The steer's six, tested

2.1 Turmeric (Curcuma longa), rhizome

The tradition. In Ayurveda haridra is warming and bitter, given for skin disease, wounds, jaundice, cough and digestion. In Jamu kunyit is the base of kunyit asam and of postpartum preparations. In Thai medicine khamin chan is a carminative for flatulent dyspepsia.

The record. Two Thai randomised trials support the Thai use. Thamlikitkul and colleagues (1989) randomised 116 adults with dyspepsia in one provincial and five community hospitals to turmeric, a carminative or placebo. A

later review gives relief at seven days as 87 per cent with turmeric against 53 per cent with placebo, which I could not confirm in the abstract [VERIFY]. Kongkam and colleagues (2023) randomised 206 patients with functional dyspepsia to curcumin (2 g a day as two 250 mg capsules four times daily), omeprazole 20 mg or both, for 28 days. All three arms improved equally, with no serious adverse events: non-inferiority against a drug that works, in a condition with a high placebo response. For knee osteoarthritis TR-02 grades an extract at A, on Kuptniratsaikul's trial of 367 patients in which 1,500 mg a day matched ibuprofen 1,200 mg (THRIVING library, TR-02). The WHO gives 1.5 to 3 g of powder a day or 3 to 9 g of crude drug for dyspepsia (WHO 1999). The trial dose sits inside that range.

The modern inference, and Nelson. Kathryn Nelson, Jayme Dahlin, Michael Walters and colleagues (Nelson et al. 2017) argued that curcumin is a PAINS (pan-assay interference compound) and an IMPS (invalid metabolic panacea) candidate: unstable, reactive and barely absorbed, so that its thousands of positive laboratory results are mostly artefacts. Of more than 120 clinical trials, none they found was a successful double-blind, placebo-controlled trial. Critics, among them Padmanaban and Nagaraj, replied that the whole rhizome may act where pure curcumin does not. Both can be true. The Thai trials tested a gut complaint, where absorption matters little. Nelson's critique bites on the systemic claims: cancer, dementia, inflammation throughout the body.

At a kitchen dose? The common figure of 60 to 100 mg of curcumin a day in Indian diets I found only on consumer sites (Healthline n.d.) [VERIFY]. A South Indian per-capita figure of about 0.6 g of turmeric a day suggests less (Statista n.d., search summary). A Korean study put Korean intake at 2.7 to 14.8 mg of curcumin a day, about a quarter of South Asian intake, implying some 10 to 60 mg (Nutrition Research and Practice 2014) [VERIFY: my arithmetic]. Even formulated supplements gave plasma levels of 1.0 to 18.6 ng/ml, about a thousand times below laboratory concentrations (Frontiers in Nutrition 2023). My inference: at a kitchen dose turmeric flavours and colours food and does nothing measurable beyond the gut [VERIFY].

Harm. Kitchen turmeric is low in risk. Concentrated extracts are not: the US Drug-Induced Liver Injury Network recorded ten liver injuries with one death, seven carrying HLA-B*35:01 and several products containing piperine (THRIVING library, TR-02). The WHO contraindicates it in biliary obstruction and, without advice, gallstones (WHO 1999). Grades: dyspepsia A. Osteoarthritis, extract, A. Systemic effects at a kitchen dose, D.

2.2 Neem (Azadirachta indica), leaf and seed oil

The tradition. Neem is the village pharmacy tree of India: twigs for the teeth, leaves for skin and fevers, oil for lamps, lice and skin. In South India drops of the oil were put into infants' noses for colds and given by mouth for colic.

The record. The Malaria Research Centre in Delhi tested 2 per cent neem oil in coconut oil on the skin in the field: protection was 96 to 100 per cent against Anopheles, 85 per cent against Aedes, 61 to 94 per cent against Culex and 37.5 per cent against Armigeres (Sharma, Dua and Sharma 1995, abstract). The same group found neem oil burned in kerosene lamps reduced biting (Sharma and Ansari 1994, search summary). I found no independent replication. IN-08 grades a neem lice shampoo at C and the neem and turmeric scabies paste at D (THRIVING library, IN-08).

Harm. By mouth, neem oil kills infants. Sinniah and Baskaran (1981) described 13 Malaysian children who vomited within minutes and became drowsy and acidotic, with a Reye-like picture. A four-month-old died in 1982, a few drops caused encephalopathy in Singapore infants, and a five-year-old Indian boy arrived in status epilepticus (secondary summaries). There is no antidote. The lookalike chinaberry, Melia azedarach, has poisonous fruit (THRIVING library, IN-08) [VERIFY].

Grades: repellent, 2 per cent on skin, B. Lice, C. Oral use in children, X.

2.3 Tulsi, holy basil (Ocimum tenuiflorum), leaf

The tradition. Tulsi is sacred to Vishnu, grown in a courtyard shrine in Hindu households, and its tea is taken for cough, fever and stress. Its ritual place is public and nothing restricted is reported here.

The record. Jamshidi and Cohen (2017) found 24 human studies, mostly small and of low quality, reporting favourable effects on metabolic markers, stress and immunity. The Norwegian Institute of Public Health concluded that methyleugenol, estragole and eucalyptol in holy basil tea may pose a risk at one or more cups a day, with reduced fertility the most critical effect in animals (FHI 2023, search summary). Commercial tulsi is often another species such as Ocimum gratissimum (DNA studies, search summary). A leaf in the pot is part of the culture. Daily medicinal tea for months is not shown to help. Grade C.

2.4 Ashwagandha (Withania somnifera), root

The tradition. Ashwagandha, "smell of horse", is a rasayana, a rejuvenating tonic for weakness, exhaustion, sleeplessness and age.

The record. TR-02 grades it B for stress and sleep on fifteen trials in 873 adults at 300 to 600 mg a day of extract (THRIVING library, TR-02). Björnsson and colleagues (2020) described five patients from Iceland and the US with cholestatic or mixed liver injury two to twelve weeks after starting, and no liver failure (abstract). Philips and colleagues (2023), at three Indian centres, confirmed 8 of 23 suspected cases from single-ingredient products. The median latency was 41 days (14 to 540). Three died, all of acute-on-chronic liver failure in people with existing liver disease. Doses ran from 500 mg to about 20 g a day, and no adulterant was found. Denmark, after the Technical University of Denmark could not set a tolerable intake, barred ashwagandha from supplements, in 2020 or 2023 by different accounts [VERIFY], and France's ANSES warned vulnerable groups in 2024. Industry disputes the Danish assessment (NutraIngredients 2026, search summary).

Never give it to anyone with liver disease or to pregnant women. Grades: anxiety and sleep, B. Liver injury, B as a harm.

2.5 Andrographis paniculata (kalmegh, fah talai jone), herb

The tradition. In Ayurveda kalmegh is the king of bitters, given for fever and liver complaints. In Thailand fah talai jone, "the sky's thunderbolt", is the household remedy for sore throat, cold and diarrhoea.

The record. TR-02 grades it B on Hu's 2017 pooling of 33 poor-quality trials in 7,175 patients, which showed less sore throat and cough (THRIVING library, TR-02). The village-relevant trial is Thamlikitkul and colleagues (1991): adults with pharyngotonsillitis took paracetamol or dried Andrographis at 3 g or 6 g a day for seven days. At day three, 6 g and paracetamol did better than 3 g. By day seven the groups did not differ (abstract). Thailand listed it for Covid-19 in 2021 at 180 mg of andrographolide a day for five days (Nation Thailand 2021, Pattaya Mail 2021). A 2025 Siriraj trial randomised 190 adults with mild Covid to that dose or favipiravir, and nobody in either arm developed pneumonia by day ten (Siriraj trial 2025, abstract). With no placebo arm, it shows no benefit of either.

The dose sources differ by preparation: extract 400 mg three times daily in Hu's trials (TR-02), dried herb 3 or 6 g a day in Thamlikitkul's. I could not read the WHO monograph dose.

Harm. Australia's Therapeutic Goods Administration had 287 reports of anaphylaxis or allergic reactions from 2005 to 2025, including a death in June 2024, has required a label warning since December 2019, and notes that reactions can occur on the first dose (TGA n.d., search summary only). Grades: sore throat and cold, B. Covid, D. Anaphylaxis, B as a harm.

2.6 Boswellia serrata (salai guggul), gum resin

TR-02 grades a standardised extract A for knee osteoarthritis, on seven trials in 545 patients, at 100 to 250 mg a day of extract with 30 per cent AKBA (THRIVING library, TR-02). No village can standardise a resin, and raw resin is untested at any dose I found. Grade A for the extract, D for raw resin.

3. The ranked table of key plants

Ranked by usefulness to a tropical village after the Fall, weighing evidence, margin of harm and ease of growing.

#	Plant, part, preparation	Use	Grade	Dose (source)	Harms	Lookalikes
1	Zingiber officinale, rhizome, dried or tea	Nausea of pregnancy and surgery	A	1 to 1.95 g/day (Viljoen 2014), 0.5 g two to four times daily (WHO 1999)	Heartburn, anticoagulants above about 12 g	Low risk
2	Andrographis paniculata, herb, powder	Sore throat, cold	B	6 g/day dried, 7 days (Thamlikitkul 1991), extract 400 mg three times daily (TR-02)	Anaphylaxis	None found
3	Curcuma longa, rhizome, powder	Dyspepsia	A	2 g/day (Kongkam 2023), 1.5 to 3 g/day (WHO 1999)	Extract liver injury, gallstones	Gloriosa tubers
4	Senna alata, leaf, lotion	Tinea versicolor	A	50% leaf lotion (Tababa 2020)	Skin irritation	Other Senna [VERIFY]
5	Zingiber cassumunar, rhizome, 14% cream	Sprain, muscle pain	B	Twice daily (Plygesal trial)	Skin irritation [VERIFY]	Other Zingiber
6	Azadirachta indica, seed oil, 2%	Mosquito repellent	B	2 ml per 100 ml (Sharma 1995)	Fatal by mouth in infants	Melia azedarach
7	Centella asiatica, leaf, poultice	Wounds, burns	C	Oral 0.33 to 0.68 g three times daily (WHO 1999)	Dermatitis, rare hepatitis	Hydrocotyle [VERIFY]
8	Terminalia chebula in Triphala, mouthwash	Gum disease	B	See TR-02	Loose stools	Other Terminalia
9	Withania somnifera, root, extract	Anxiety, sleep	B	300 to 600 mg/day (TR-02)	Liver injury	Physalis [VERIFY]

#	Plant, part, preparation	Use	Grade	Dose (source)	Harms	Lookalikes
10	Boswellia serrata, resin, extract	Knee osteoarthritis	A extract	100 to 250 mg/day (TR-02)	Gut upset	Other resins
11	Cymbopogon nardus, winterianus, oil	Repellent	A (weak)	Under 2 hours protection	Skin irritation	C. citratus
12	Rauvolfia serpentina, root, district only	Hypertension	A (reserpine)	0.1 to 0.25 mg reserpine (TR-02), 0.5 mg+ in Cochrane trials	Depression, suicide	Other Rauvolfia [VERIFY]
13	Mucuna pruriens, roasted seed, district only	Parkinson's	B	12.5 to 17.5 mg/kg levodopa (Cilia 2017), 15 and 30 g seed (TR-02)	Dyskinesia, low pressure	Wild cowhage [VERIFY]
14	Ocimum tenuiflorum, leaf, tea	Stress, cough	C	Under 1 cup/day (FHI 2023)	Methyleugenol	O. gratissimum
15	Syzygium aromaticum, oil on tooth	Toothache	C	A drop on cotton [VERIFY]	Kills small children by mouth	None
16	Aegle marmelos, unripe fruit	Diarrhoea	D	No tested human dose	Constipation [VERIFY]	Limonia [VERIFY]
17	Holarrhena pubescens, bark	Amoebic dysentery	D	4 g/day toxic in 3 of 11 (IJPP 1983)	Hypotension	Wrightia tinctoria
18	Gymnema sylvestre, leaf	Diabetes	C	No agreed dose	Hypoglycaemia, hepatitis	None found
19	Momordica charantia, fruit	Diabetes	D	None	Hypoglycaemia	Wild gourds
20	Cinnamomum cassia, bark	Diabetes claims	D	Under 2 g/day at 60 kg (BfR)	Coumarin	Sold as cinnamon
21	Tinospora cordifolia, stem	Fever, immunity	X pending	None established	Hepatitis	Other Tinospora
22	Commiphora wightii, guggulipid	Cholesterol	X	LDL worse (TR-02)	Rash	Other Commiphora

#	Plant, part, preparation	Use	Grade	Dose (source)	Harms	Lookalikes
23	Psoralea corylifolia, seed	Vitiligo	D benefit, B harm	No threshold found	Liver failure	Other legumes

4. The other plants

4.1 Ginger (Zingiber officinale)

The tradition. Ginger, sunthi dried and ardraka fresh, is called the universal medicine in Ayurveda. Jahe is the warming base of Javanese drinks for masuk angin, and khing the Thai remedy for nausea and flatulence.

The record. This is the region's surest plant. Viljoen and colleagues (2014) pooled 12 trials in 1,278 pregnant women: ginger improved nausea (mean difference 1.20, 95 per cent confidence interval 0.56 to 1.84) but not significantly vomiting. Doses were 600 to 2,500 mg a day, mostly 1,000 to 1,950 mg. The miscarriage risk ratio was 3.14 with an interval of 0.65 to 15.11, which neither shows nor rules out harm. Chaiyakunapruk and colleagues (2006) pooled five trials in 363 surgical patients: at least 1 g before surgery reduced postoperative nausea and vomiting (relative risk 0.69, 0.54 to 0.89) (abstract). The WHO gives 0.5 g two to four times daily for motion sickness and cautions with anticoagulants and gallstones, noting that 2 g a day for 14 days left bleeding time unchanged (WHO 1999). The sources agree on about 1 g of dried ginger a day for nausea. Grade A.

4.2 Holarrhena pubescens (kutaja) and Brucea javanica

Kutaja bark is Ayurveda's chief remedy for diarrhoea and dysentery. I found no randomised trial of it alone. Singh's 1986 series of 20 cyst passers reported 70 per cent good response with no control group. A Karachi trial of about 202 patients and an open-label trial of 70 (NCT02642250) tested multi-herb capsules, so neither isolates the plant (search summaries). In 1983, 4 g a day of bark for 15 days in 11 patients produced drug-induced symptoms in three and hypotension in one (IJPP 1983). TR-02 grades it D and warns of confusion with Wrightia tinctoria (THRIVING library, TR-02). I agree. Amoebic dysentery needs metronidazole, or failing that rehydration and a microscope.

Brucea javanica fruit was a Southeast Asian remedy for amoebic dysentery and malaria. The WHO lists no clinically supported use, records it as less effective than emetine, contraindicates it in children, pregnancy and nursing, and notes anaphylaxis (WHO 1999). Grade D, with harm.

4.3 Bael (Aegle marmelos), unripe fruit

Bael is sacred to Shiva, and its unripe fruit is a classical Ayurvedic and Unani remedy for diarrhoea. A decoction of dried unripe pulp killed Giardia and inactivated rotavirus in the laboratory but did not affect bacteria (Brijesh et al. 2009). The only clinical trial I found, in Bangladeshi adults with shigellosis, showed no benefit (Haider et al. 1991, secondary summary only) [VERIFY]. Grade D. Bael is a good food tree, not a treatment for dysentery.

4.4 Terminalia chebula (haritaki)

TR-02 grades Triphala, of which T. chebula is one fruit, at B as a mouthwash (THRIVING library, TR-02). I found no trial of T. chebula alone.

4.5 Centella asiatica (gotu kola, pegaga, bua bok), leaf

Mandukaparni is an Ayurvedic brain tonic and wound herb, pegaga a raw green that Malays and Indonesians also pound onto wounds, and bua bok a cooling Thai juice. The WHO accepts wounds, burns and keloid and gives 0.33

to 0.68 g of dried leaf three times daily by mouth (WHO 1999). A 2022 systematic review found four wound trials, all positive but too varied to pool (Arribas-López et al. 2022 [VERIFY authors]), and a Thai review agreed (Thai Centella review, abstract). I found no second oral dose source. Jorge and Jorge (2005) reported three Argentine women with granulomatous hepatitis 20 to 60 days into taking it, recurring on rechallenge. Contact dermatitis occurs (WHO 1999). Grade C for wounds, topical.

4.6 Rauvolfia serpentina (sarpagandha), root, and reserpine

Sarpagandha, "snake smell", was used in India for snakebite, fever and insanity, and TR-02 tells its passage into Western medicine through Vakil in 1949 (THRIVING library, TR-02). The Cochrane review by Shamon and Perez (2016) found four trials in 237 people: reserpine at 0.5 mg a day or more lowered systolic pressure by 7.92 mmHg (1.78 to 14.05). In 1954 Edward Freis described five patients with severe depression after long, large doses, one at 1.0 mg twice daily (Freis 1954). Reports of the 1950s put depression at 10 to 15 per cent at the doses then used (JFP 1985). The modern dose is 0.1 to 0.25 mg a day (THRIVING library, TR-02).

The crude root is the problem. The Drug and Therapeutics Bulletin gave 100 mg of whole root as about 1 mg of total alkaloids, or 0.1 to 0.25 mg of reserpine (DTB n.d.), and the USP standard required 0.15 to 0.20 per cent alkaloids (USP n.d.). Wild roots vary and a household cannot assay them. My inference is that crude root belongs only at a district infirmary with a scale and a blood-pressure cuff, starting low, and never for anyone with a history of depression [VERIFY]. Grade A for reserpine, B for the depression harm.

4.7 Mucuna pruriens (kapikacchu), seed

Ayurveda gave kapikacchu for kampavata, the shaking palsy, long before levodopa was known. TR-02 gives Katzenschlager's crossover of 8 patients at 15 and 30 g of seed (THRIVING library, TR-02). Cilia and colleagues (2017) treated 18 Bolivian patients with advanced Parkinson's disease with seeds of a local ecotype holding 5.7 per cent levodopa, roasted 15 minutes, peeled, ground and sieved. A high dose of 17.5 mg/kg levodopa equivalent matched standard levodopa-carbidopa, with fewer dyskinesias. That is about 300 mg of powder per kg, by my arithmetic [VERIFY]. The trial tested single doses only. Grade B, at the district rung, with a scale and a nurse who knows levodopa's effects.

4.8 Momordica, Gymnema and guggul

Bitter gourd (karela, pare, mara) is graded D on Ooi's Cochrane review, which found the trials too few and poor (THRIVING library, TR-02). Gymnema sylvestre (gurmar, "sugar destroyer") numbs sweet taste on the tongue. A 2021 meta-analysis of ten studies in 419 participants found a small fall in fasting glucose (Phytotherapy Research 2021, search summary), and toxic hepatitis is reported (Gymnema hepatitis case 2010). Grade C. Guggulipid made LDL cholesterol worse than placebo (THRIVING library, TR-02). Grade X. In a village, diabetes is managed by diet, weight and walking.

4.9 Cloves and cinnamon

Clove oil (Syzygium aromaticum) is 60 to 90 per cent eugenol. A drop on cotton against an aching tooth is traditional and plausible, grade C [VERIFY: no dental trial read]. Swallowed, it destroys a child's liver: a 15-month-old who drank about 10 ml and a three-month-old given under 8 ml developed liver failure and were treated with intravenous N-acetylcysteine (Eur J Pediatr 2005, J Toxicol Clin Toxicol 2004). Toxic doses in small children are 5 to 10 ml (Vanderbilt n.d.).

Ceylon cinnamon (Cinnamomum verum) has hardly any coumarin. Cassia (C. cassia and the Indonesian C. burmannii) averages about 3 g of coumarin per kg and reaches 10 g. The tolerable daily intake of 0.1 mg per kg is reached

by a 60 kg adult at about 2 g of cassia a day and a 15 kg child at 0.5 g. Exceeding it for one or two weeks is acceptable (BfR n.d.). Cinnamon for diabetes: D.

4.10 Senna alata (akapulko, ketepeng cina), leaf

Filipinos, Indonesians, Malays and Thais rub the pounded leaf on ringworm and on the pale patches of tinea versicolor, and the Philippine Department of Health lists akapulko among its ten approved medicinal plants (Tababa et al. 2020). Tababa and colleagues reviewed seven randomised trials in 460 participants, five from the Philippines. Against terbinafine, mycological cure did not differ (relative risk 0.93, 0.86 to 1.01, 150 participants, high certainty). Against 25 per cent sodium thiosulfate it was similar for mycological cure (0.91, low certainty) but worse for clinical cure (0.63). The preparations were a 50 per cent leaf lotion and a soap. Damodaran and Venkataraman (1994) found a leaf extract effective in pityriasis versicolor (abstract). Grade A for tinea versicolor, small regional trials. Grade C for body ringworm.

4.11 Plai (Zingiber cassumunar)

Plai is the Thai remedy for bruises, sprains and aching muscles, used in the steamed herbal compress ball (luk pra kob) and in prasa plai, a postpartum formula on the essential list (Asia News Network 2026). A double-blind trial of 14 per cent Plai cream against placebo in ankle sprain, twice daily, reduced swelling and pain at four days and paracetamol use in the first two (Plygesal trial, abstract only, small). Chongmelaxme and colleagues (2018) found four randomised and two quasi-experimental studies with a strong trend to benefit (search summary). Grade B for the cream, D for the compress [VERIFY].

4.12 Cymbopogon: lemongrass and citronella

Lemongrass (C. citratus, takrai) is a food and a tea for fever and digestion. Citronella grass (C. nardus, C. winterianus) is grown and burned against mosquitoes. Kongkaew and colleagues (2011) pooled eleven laboratory studies: citronella's protection time was 253 minutes shorter than DEET's (169 to 336), and adding vanillin prolonged it. A 2015 study measured 13.5 minutes for 5 per cent citronella against 301.5 for 23.8 per cent DEET (search summary). Lemongrass tea has no human trial I found (Drugs.com n.d.). Grade A that citronella repels briefly and less than DEET. A bednet beats every plant.

4.13 The Jamu staples

Daily jamu is built from the ginger family, kunyit (turmeric), temulawak (Curcuma xanthorrhiza), jahe (ginger), kencur (Kaempferia galanga), with tamarind, palm sugar, rice and betel leaf. Those based on ginger or turmeric inherit the grades above. For temulawak and kencur I found no trial, grade D. Household jamu, made fresh from known plants, is low in risk. Jamu bought in sachets carries the drug risk in section 7.

5. The liver: which plants injure it, and at what dose

For these herbs no dose is known to be free of risk, because the injury depends on the person more than the dose.

- Ashwagandha: 500 mg to 20 g a day, median onset 41 days, deaths only in existing liver disease (section 2.4).
- Tinospora cordifolia (giloy), promoted by AYUSH for immunity during Covid-19: Kulkarni and colleagues (2022) collected 43 patients from 13 Indian centres, median latency 46 days, probable causality in 67.4 per cent, antinuclear antibody the commonest autoantibody. Two died and one needed a transplant (news report). I did not find the doses taken [VERIFY]. Critics noted that 49 were enrolled and 43 analysed, and Harshad Devarbhavi that only 4 of 22 biopsied met autoimmune hepatitis criteria (Hepatology Communications letters 2022, search summary). AYUSH called the report misleading (THRIVING library, TR-02). The signal stands.

- Psoralea corylifolia (babchi), for vitiligo: a 2005 Korean cholestatic hepatitis at more than ten times the usual seed dose, a fatal liver failure in 2019 after about seven months, and 2023 cases from Bakuchi tablets (case reports, search summaries). No threshold found.
- Turmeric extracts with piperine (TR-02), Centella (Jorge and Jorge 2005) and Gymnema (case report).

Recognition: tiredness and nausea, then dark urine, pale stools, yellow eyes and itching, from two weeks to several months after starting. Stop every herb at once. Most recover in weeks. Confusion, bleeding or drowsiness mean liver failure, which a village cannot treat.

6. The poisons in the same pharmacopoeia

The classical pharmacies hold plants that kill, and some grow in hedges. Shodhana is said to exist and to reduce toxicity in animal tests. No processing method is given here, because the record shows it does not make these plants fit for home use.

Strychnos nux-vomica (kuchla). In rats, shodhana raised the seed's lethal dose from 256 to 2,600 mg/kg (Setty 2009, search summary). Strychnine blocks glycine receptors: stiffness, then spasms and convulsions in a conscious patient, then fever, muscle breakdown, kidney failure and respiratory arrest. Indian case reports involve home decoctions of raw seed (search summary). X.

Aconitum ferox (vatsanabha). PH-10 holds the Asian aconite data, including Hong Kong's third of cases from overdose and third from dispensing error (THRIVING library, PH-10). In India an overdose of Mahashankha Vati, an aconite tablet, brought a patient in with a blood pressure of 30/10 and a pulse of 46 (Mahashankha Vati case report). Tingling mouth and limbs, vomiting, then a slow or chaotic heart. X.

Abrus precatorius (gunja, saga). The red, black-eyed seeds are threaded as beads. Swallowed whole, a seed usually passes. Chewed or crushed, it releases abrin, fatal at an estimated 0.1 to 1 microgram per kg (WestJEM case report). An Indian series reported 78 per cent women, diarrhoea in 66 per cent and mortality about 5.35 per cent (search summary, paper not identified) [VERIFY]. Death comes from fluid loss, so rehydration is the treatment. A Mahidol text lists Abrus leaf as a sweet herb for children in Thai medicine (Vallisuta n.d.). The leaf is not the seed, but a household with children should not keep the plant [VERIFY].

Gloriosa superba (glory lily, kalihari). Its tubers are mistaken for yams. In Sri Lanka's Western Province it caused 44 per cent of plant poisonings, with 15 per cent dying (APJMT n.d., BMJ Case Reports 2019). The poison is colchicine, lethal at about 0.8 mg/kg. It looks at first like gastroenteritis, death follows in two to seven days from marrow and organ failure, and there is no antidote a village can hold.

Yellow oleander (Cascabela thevetia) and Cerbera manghas. At Jaffna in 1983 and 1984 yellow oleander caused 12 to 17 per cent of poisonings, with 6 to 7 per cent dying, and later Sri Lankan series of thousands gave 3 to 4 per cent (Sri Lankan series, search summary). Michael Eddleston and colleagues showed in a randomised trial that anti-digoxin antibody fragments reversed the cardiac toxicity (Eddleston et al. 2000). When the antitoxin ran out in July 2002, deaths rose about threefold (Eddleston et al. 2003).

The Fall makes these plants more dangerous, because the antidotes and intensive care that held aconite and oleander deaths to a few per cent are exactly what is lost.

7. Metals and hidden drugs: how to recognise the risk

7.1 Rasa shastra

TR-02 holds the detail. Saper and colleagues found lead, mercury or arsenic in 14 of 70 Ayurvedic products in Boston in 2004 (20 per cent), and in 20.7 per cent of 193 bought online in 2008, with rasa shastra products contaminated about 41 per cent of the time against 17 per cent for others. In New York six pregnant women were poisoned and

two miscarried (THRIVING library, TR-02). In the tradition's own terms these metals are the medicine, made fit for use by repeated calcination. Blood levels say otherwise.

In the product: the trigger words bhasma, ras or rasa, sindoor, kajjali, parada (mercury), naga (lead), swarna (gold), abhrak (mica), makaradhwaja (THRIVING library, TR-02). In the person: for lead, colic, constipation, pallor and anaemia, later wrist weakness. For arsenic, darkened skin and thick palms and soles. For mercury, tremor, sore gums and kidney damage. Any of these in someone taking a bought Ayurvedic, Unani or Tibetan preparation means stop it and keep the packet.

7.2 Steroids and painkillers in jamu and Thai remedies

Hidden drugs are the Southeast Asian counterpart of the metal risk. Indonesian law forbids bahan kimia obat (BKO), chemical drugs, in jamu. The food and drug agency BPOM's warning of 11 December 2017 listed 39 traditional medicines containing drugs, 14 of them virility jamu, one with sildenafil and phenylbutazone together. In October 2022 it warned against a muscle-ache jamu (pegal linu), and a thesis testing ten brands of that type found dexamethasone in six and both drugs in two (Indonesian theses, search summary). A raid in Kemang, Bogor, seized some 300,000 bottles of hazardous liquid worth about Rp6.2 billion (JPNN n.d.) [VERIFY: contents]. In Hat Yai in 2008, four traditional medicines from 54 stores held steroids, three dexamethasone and one prednisolone (Hat Yai survey 2008). The Thai National Health Assembly reported, among people taking steroids without medical reason, Cushing's syndrome in 48 per 1,000, adrenal insufficiency in 9 per 1,000 and mortality of 6.4 per cent (Thai NHA n.d.). Malaysia found poisonous ingredients in Dong Mai Tan in 2016 (NST 2016).

Recognition: a "herbal" pill that removes joint pain within a day and is bought again and again, and users who develop a round face, swollen ankles, weight gain, thin bruising skin, high sugar or blood pressure. Phenylbutazone adds stomach bleeding (black stools) and, rarely, marrow failure [VERIFY]. Do not stop a steroid-laced remedy suddenly after weeks of use, because sudden withdrawal can cause adrenal collapse. Reduce it over weeks [VERIFY: my inference from standard steroid practice]. Thai scientists developed a strip test for dexamethasone and prednisolone in herbal products (Thai DMSc kit, abstract).

8. What a tropical village should grow first

1. Ginger, in loose rich soil. Grade A for nausea, and a food.
2. Turmeric, beside it. Grade A for dyspepsia at 2 g a day, a food and a dye.
3. Andrographis, an annual from seed. Grade B for sore throat and colds.
4. Senna alata, a shrub at the village edge. Grade A for tinea versicolor.
5. Plai, for sprains and aching muscles.
6. Citronella and lemongrass along paths. Weak repellents and food.
7. A neem tree, for 2 per cent repellent oil and lice. Never by mouth for children.
8. Centella in wet ground, for wounds and greens.
9. Bael and tamarind for food, tulsi in the cooking pot.

At the district: Mucuna in a fenced plot, and Rauvolfia only where a nurse can weigh doses and measure blood pressure.

Remove from house gardens, school grounds and hedges near homes: Gloriosa superba, Abrus precatorius, yellow oleander, Cerbera and ornamental Strychnos. A drawing of each belongs on the dispensary wall.

Evidence grades

Remedy and use	Basis	Grade
Ginger, nausea of pregnancy and surgery	12 trials, 1,278 women. 5 trials, 363 patients	A
Turmeric powder 2 g/day, dyspepsia	Two Thai trials, 116 and 206 patients	A
Turmeric, systemic effects at kitchen dose	Plasma far below active levels	D
Senna alata lotion, tinea versicolor	7 trials, 460 patients	A
Andrographis, sore throat and cold	33 poor trials (TR-02), Thai 1991 trial	B
Andrographis, Covid-19	No placebo comparison	D
Boswellia extract, knee osteoarthritis	7 trials, 545 patients (TR-02)	A
Plai cream, sprain	Small trials, review trend	B
Neem oil 2%, repellent	Field series, one group	B
Citronella, repellent	Lab pooling, far shorter than DEET	A (weak)
Ashwagandha, anxiety and sleep	15 trials (TR-02)	B
Tulsi, stress. Centella, wounds. Gymnema, diabetes	Small or unpoolable studies	C
Reserpine, blood pressure	Cochrane, 4 trials	A
Mucuna seed, Parkinson's	2 small crossover trials	B
Holarrhena, bael, Momordica, Brucea	No trial of the plant alone, or negative	D
Neem oil by mouth, guggulipid, Tinospora, rasa shastra, the poisons	Harm or no benefit	X

Means ledger

Remedy	Hands and hearth	Garden and still	Village dispensary	District infirmary	Hospital before the Fall
Ginger, nausea	Spot hyperemesis, fresh tea	Powder weighed to 0.25 g	Oral rehydration	IV fluids	Antiemetics
Turmeric, dyspepsia	Ask alarm signs	Weighed 0.5 g doses	Register	Liver tests	Endoscopy, omeprazole
Andrographis, throat	Check for pus and neck swelling	Weighed powder	First dose watched, adrenaline if salvaged	Penicillin if held	Swab, antibiotics
Senna alata, tinea	Pounded leaf	50% lotion, soap	Microscope scraping	Same	Antifungals
Neem repellent	Covering at dusk, nets	Oil mixed at 2%	Nets	Malaria microscopy and drugs	Treated nets, DEET
Rauvolfia, Mucuna	Salt reduction	Not advised	Not advised	Weighed doses, cuff, mood watch	Modern drugs

Remedy	Hands and hearth	Garden and still	Village dispensary	District infirmary	Hospital before the Fall
Metals, hidden drugs	Read labels, refuse bought pills	Grow your own	Remedy register	Strip tests, blood counts	Blood lead, chelation
Poison ingestion	Know the plant, rehydrate	Remove plants	Charcoal if held [VERIFY]	Heart watch, fluids	Antitoxin, intensive care

What each rung changes. Knowledge alone saves most lives here: it recognises the poisons and danger signs and keeps metal pills out of the house. The hearth adds the teas and the rehydration that treats Abrus and most diarrhoea. The scale turns a folk remedy into the preparation that was trialled. The dispensary adds the microscope and a register that catches liver injury. The district is the first rung where Rauvolfia and Mucuna can be used without grave risk. The hospital before the Fall had standardised drugs and antitoxins no later rung can match.

Harm test

Remedy	Harm and dose	Never give to	Signs	Response	Case
Ginger	Bleeding interaction above about 12 g/day	Gallstone pain without advice	Heartburn	Lower dose	None serious found
Turmeric extract	Liver injury, with piperine	Liver disease, gallstones	Jaundice at 1 to 4 months	Stop all herbs	DILIN, 1 death
Andrographis	Anaphylaxis, any dose	Prior reaction, pregnancy [VERIFY]	Hives, swelling, wheeze	Lie flat, adrenaline if held	TGA, 287 reports, 1 death
Neem oil	Encephalopathy, a few drops	Any child by mouth	Vomiting, drowsiness, fits	Supportive	Malaysia 1981
Ashwagandha, Tinospora	Liver injury, unpredictable	Liver disease, pregnancy	Jaundice at 2 to 12 weeks	Stop	3 and 2 deaths
Reserpine	Depression above 0.5 mg/day	History of depression	Low mood, early waking	Stop, stay near	Freis 1954
Mucuna	Dyskinesia, low pressure	Psychosis [VERIFY]	Writhing, fainting	Reduce	Cilia 2017
Clove oil	Liver failure at 5 to 10 ml	Children by mouth	Vomiting, drowsiness	NAC if held	2004, 2005 infants
Cassia	Coumarin above 2 g/day adult	Children as medicine	Rare	Use Ceylon cinnamon	BfR
Holarrhena	Hypotension at 4 g/day	Low blood pressure	Faintness	Stop	3 of 11, 1983
Metal remedies	Lead, mercury, arsenic	Pregnancy, children	Colic, anaemia, tremor	Stop, keep packet	New York, 2 miscarriages
Steroid-laced jamu	Cushing's, adrenal collapse	Anyone	Moon face, swelling	Taper, never stop suddenly	Thai NHA

Red flags

- Sore throat with drooling, inability to swallow, a muffled voice or a swollen neck: an abscess or epiglottitis. Sit the patient up and send for the district. Andrographis will not help.
- A sore throat followed weeks later by joint pain or breathlessness in a child: rheumatic fever, which a village without penicillin cannot prevent [VERIFY].
- Bloody diarrhoea with fever in a young child, or sunken eyes and no urine: oral rehydration first, always. Holarrhena and bael are not treatments.
- Vomiting in pregnancy with nothing kept down for a day: hyperemesis. Ginger is not enough. Fluids by any route.
- Yellow eyes and dark urine in anyone taking a herb: stop everything. Confusion or bleeding on top means liver failure.
- Hives, swollen lips or wheeze after a herbal dose: anaphylaxis. Lay flat, legs raised, adrenaline if held, and never that herb again.
- Vomiting and diarrhoea hours after "yams" or bright seeds: think of Gloriosa or Abrus. Rehydrate hard and prepare the family.
- A slow or irregular pulse and fainting after oleander seeds or an aconite pill: without antitoxin many survive with rest and fluids, some do not. Stay with them.
- A child given neem oil who becomes drowsy or fits: keep the airway clear, turn on the side, sugar by mouth if awake.
- A patient on reserpine who stops eating and speaks of death: stop the drug and do not leave them alone.

For the poisonings and liver failure beyond the village, what remains is a quiet place, someone present, sips of water and relief of pain with what is held.

The case against

Against turmeric, Nelson, Dahlin and Walters (Nelson et al. 2017) argue that curcumin seems to do everything in the test tube because it interferes with the tests, and that no double-blind trial had succeeded. I accept this for systemic claims and set it aside for the gut, where Thai trials found turmeric worked against placebo and matched omeprazole.

Against the metal preparations, Robert Saper and colleagues showed that one bought product in five was contaminated, rasa shastra the worst (THRIVING library, TR-02). Defenders say properly made bhasma is harmless. The poisoned pregnant women in New York say the products people actually buy are not.

Against the "harmless herb", the hepatologists Cyriac Abby Philips, Einar Björnsson and Anand Kulkarni documented liver injury and deaths from ashwagandha and Tinospora, two herbs AYUSH promoted in the pandemic. Harshad Devarbhavi and AYUSH answer that the series are retrospective and the autoimmune diagnosis loose. True, and still a signal for a village with no liver unit.

Against state promotion, the Covid-era record is the strongest argument. India's AYUSH ministry promoted AYUSH-64, giloy and the Coronil kit (THRIVING library, TR-02), and Thailand listed Andrographis for Covid before any placebo-controlled trial existed.

Against the romance of the hospital, the region offers its own corrections. Roasted Mucuna seed in Bolivia matched the factory drug for a single dose (Cilia et al. 2017). Senna alata leaf matched terbinafine for tinea versicolor. And Sri Lankan oleander deaths tripled when the antitoxin ran out (Eddleston et al. 2003), which shows both what the hospital was worth and how fragile it is.

10-line summary

1. Ginger is the region's surest plant: about 1 g of dried rhizome a day eases nausea of pregnancy and surgery.

2. Turmeric powder at 1.5 to 3 g a day helped dyspepsia in two Thai trials. At a kitchen dose it does nothing measurable elsewhere.
3. Senna alata leaf lotion matched terbinafine for tinea versicolor in Philippine trials.
4. Andrographis eases sore throat and cold (B) and can cause fatal anaphylaxis, sometimes at the first dose.
5. Neem oil at 2 per cent repels mosquitoes on the skin. By mouth it kills infants.
6. Ashwagandha, Tinospora, Psoralea, turmeric extracts and Centella injure the liver unpredictably.
7. One bought Ayurvedic product in five held toxic metals, and jamu and Thai pain remedies often hold dexamethasone or phenylbutazone.
8. Reserpine lowers blood pressure and above about 0.5 mg a day causes depression. Crude root cannot be dosed at home.
9. Mucuna seed is a real levodopa source, for a district with a scale and a nurse.
10. Strychnos, Aconitum, Abrus, Gloriosa and yellow oleander kill. Know them on sight and keep them out of gardens.

Open questions

- How large is turmeric's effect on dyspepsia outside two small Thai trials?
- Does whole turmeric act where pure curcumin does not? No trial compared them.
- What doses did the Tinospora patients take, and is there a lower dose without risk?
- When did Denmark bar ashwagandha, 2020 or 2023, and on what evidence?
- Is there any trial of Holarrhena alone against metronidazole?
- What household Senna alata preparation matches the trial lotion, and for how many weeks?
- Can crude Rauvolfia root be dosed at a district without assay?
- How often are Thai and Indonesian remedies adulterated now? The best data are 2008 to 2022.

Sources to read in full

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At the bedside after the Fall

Household

Minimum viable version: a bed of ginger and turmeric, an Andrographis plant, a Senna alata shrub, a bottle of neem oil kept high, and the habit of refusing bought pills with metal names or that work too well on joint pain.

To start: rhizomes, a kitchen scale or calibrated spoon, a mortar, coconut oil, and the five plants to remove: glory lily, rosary pea, yellow oleander, Cerbera, Strychnos. Skills: dosing by weight, recognising yellow eyes and hives, mixing a 2 per cent oil. Records: a sheet of what each person takes and since when.

First failure to expect: a grandmother giving neem oil to a colicky baby, or a market "herbal" pain remedy laced with dexamethasone.

Village of 300

Minimum viable version: a plot of the nine plants in section 8, a dispensary with weighed ginger, turmeric and Andrographis, Senna alata lotion, neem repellent, a register of every herbal remedy given, and a wall chart of the poison plants.

To start: a lay healer trained in the protocols, a balance to 0.1 g, sachets, bottles, a microscope, oral rehydration salts and any adrenaline that can be salvaged. Skills: weighing, watching a first Andrographis dose, examining a throat, recognising jaundice and anaphylaxis, reading labels for trigger words. Records: the remedy register with start dates, so that jaundice six weeks after a new herb is linked to it.

First failure to expect: liver injury from a well-meant tonic (ashwagandha or giloy) missed because nobody recorded when it was started.

District of 3,000

Minimum viable version: all of the above, plus a nurse who can use Rauvolfia and Mucuna under weighed doses with blood-pressure readings, a bench for bilirubin and blood counts, and steroid strip tests if any can be had.

To start: a fenced Mucuna plot, Rauvolfia root, a cuff, batch weighing, a poisoning register. Skills: levodopa titration, spotting reserpine depression, managing poisoning with fluids and monitoring.

First failure to expect: a patient on crude Rauvolfia root becoming depressed because one batch was twice as strong as the last.

Protocols

Protocol 1. Ginger for nausea in pregnancy or after an operation

Sources: Viljoen et al. 2014 (600 to 2,500 mg a day, mostly 1,000 to 1,950), WHO 1999 (0.5 g two to four times daily), Chaiyakunapruk et al. 2006 (at least 1 g before surgery). They agree on about 1 g a day.

- ☐ Check danger signs first: nothing kept down for 24 hours, dark scanty urine, fever or abdominal pain. If present, rehydrate and send for the district.
- ☐ Weigh 0.25 g dried ginger (plus or minus 0.05 g). Give four times a day, 1 g a day.
- ☐ Without a scale: 4 to 5 g of fresh rhizome (the size of the top joint of a thumb), sliced thin, in 200 ml of water just off the boil, covered, 10 minutes. Two to four cups a day [VERIFY: fresh-to-dried ratio is my estimate].
- ☐ Before an operation: 1 g dried, one hour before.
- ☐ Never more than 2.5 g dried a day in pregnancy, the highest dose tested.
- ☐ Caution with anticoagulants and gallstone pain.
- ☐ Expect less nausea in two to three days. Vomiting may not change.
- ☐ Record dose, start date and response.

Protocol 2. Andrographis for sore throat and cold

Sources: Thamlikitkul et al. 1991 (dried herb 3 or 6 g a day, 7 days, 6 g better at day 3) and TR-02 (extract 400 mg three times daily, 3 to 7 days). They differ by preparation. This uses dried herb.

- ☐ Look in the throat and feel the neck. Drooling, inability to swallow or a swollen neck are red flags.
- ☐ Dry the aerial parts in shade until brittle, grind and sieve. Harvest before flowering [VERIFY].
- ☐ Weigh 1.5 g (plus or minus 0.1 g). Give four times a day, 6 g a day [VERIFY: the trial's division of the daily dose].
- ☐ Watch the first dose for 30 minutes for hives, facial swelling or wheeze [VERIFY: watch period is my inference].
- ☐ At any allergy: stop, lay flat with legs raised, adrenaline if held, and write "never Andrographis" in the record.

- ☐ Not for anyone who has reacted before, not in pregnancy [VERIFY], not beyond 7 days.
- ☐ Expect easing by day 3. If worse at day 3 or fever beyond day 5, reassess.

Protocol 3. Turmeric powder for dyspepsia

Sources: Kongkam et al. 2023 (2 g a day, 28 days) and WHO 1999 (1.5 to 3 g a day). They agree.

- ☐ Check alarm signs first: vomiting blood, black stools, weight loss, difficulty swallowing, new indigestion after about 55 [VERIFY]. These need the district.
- ☐ Prepare: boil fresh rhizomes 30 to 45 minutes, slice, sun-dry until they snap, grind and sieve [VERIFY: household method].
- ☐ Weigh 0.5 g (plus or minus 0.1 g). Four times a day with food, 2 g a day.
- ☐ Add no black pepper or piperine. Liver injuries clustered in products with piperine.
- ☐ Not for people with gallstones, jaundice or liver disease.
- ☐ Up to 4 weeks. If no better, stop and reassess.
- ☐ Stop at once if eyes yellow, urine darkens or itching starts.

Protocol 4. Senna alata for tinea versicolor and ringworm

Sources: Tababa et al. 2020 (50 per cent leaf lotion or soap) and Damodaran and Venkataraman 1994 (leaf extract). The household method is my rendering of the trial lotion.

- ☐ Confirm: pale or brown scaly patches on the trunk (versicolor), or a ring with a raised scaly edge (ringworm). A skin scraping under the microscope confirms fungus.
- ☐ Wash fresh leaves. Pound 50 g of leaf with 50 ml of clean water [VERIFY: my rendering of a 50 per cent preparation].
- ☐ Strain through clean cloth. Cover. Use within one day.
- ☐ Wash and dry the skin. Rub the juice into the patches and 2 cm beyond the edge, twice a day.
- ☐ Continue 2 to 4 weeks and one week past the last scale [VERIFY: trial durations not recorded].
- ☐ Stop if the skin blisters or burns.
- ☐ Colour returns over months, even after cure. Persisting scale, not persisting colour, means failure.

Protocol 5. Neem oil 2 per cent mosquito repellent

Source: Sharma, Dua and Sharma 1995 (2 per cent in coconut oil), supported in principle by Sharma and Ansari 1994. No independent second source for the strength.

- ☐ Measure 2 ml neem oil and 98 ml coconut oil (plus or minus 0.2 ml neem). Mix in a clean bottle.
- ☐ Label "NEEM, FOR SKIN, POISON BY MOUTH". Store high.
- ☐ Apply a thin film to exposed skin at dusk. Reapply after washing or heavy sweating.
- ☐ Never on infants. Never on a child's hands or face.
- ☐ Never by mouth or in the nose, for anyone.
- ☐ Use with bednets, not instead of them. Expect weaker protection against Culex and Aedes than Anopheles.

Protocol 6. Screening any bought, inherited or gifted remedy

Sources: TR-02 for trigger words and signs, BPOM and Thai survey data for hidden drugs, section 6 for poisons.

- ☐ Reject any label with bhasma, ras or rasa, sindoor, kajjali, parada, naga, swarna, abhrak, makaradhwaja.
- ☐ Reject unregistered jamu or Thai remedies sold loose, or promising fast relief of joint pain or virility.
- ☐ Ask whether it contains kuchla, vatsanabha, gunja, kalihari or oleander. If yes, or the seller does not know, reject it.

- ☐ Keep every packet in a labelled bag with date and name.
- ☐ Round face, swollen ankles or bruising after weeks of a remedy: do not stop suddenly. Reduce over two to four weeks [VERIFY].
- ☐ Colic, anaemia, tremor or sore gums on a remedy: stop it, keep the packet, record it.
- ☐ Enter every remedy in the register: name, source, start date, dose, outcome.

Numbers to carry

1. Ginger: about 1 g dried a day for nausea, never above 2.5 g in pregnancy.
2. Turmeric powder: 2 g a day (0.5 g four times) for dyspepsia, up to 4 weeks.
3. Andrographis dried herb: 6 g a day for no more than 7 days, first dose watched.
4. Neem oil: 2 per cent on skin. Not one drop by mouth for a child.
5. Clove oil: 5 to 10 ml can destroy a small child's liver.
6. Cassia: no more than 2 g a day for an adult, 0.5 g for a small child.
7. Reserpine: 0.1 to 0.25 mg a day, about 100 mg of root. Depression above about 0.5 mg.
8. Herbal liver injury: 2 weeks to 3 months after starting, median about 6 weeks.
9. One bought Ayurvedic product in five held toxic metals.
10. Gloriosa: 15 per cent of Sri Lankan poisonings died. Colchicine kills at about 0.8 mg/kg.

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