



DOSSIER · SUBSTANCE

# Centella Asiatica (Gotu Kola)

Centella asiatica, also referred to in the literature as Gotu Kola, is primarily associated with wound healing, skin care and vascular protection. The most striking feature of this evaluation: The most frequently cited work overall is a review, and almost all controlled human studies test multi-substance preparations instead of the plant alone. They are contrasted by 19 controlled and 55 observational studies in humans.

**631**

STUDIES IN  
TOTAL

**74**

IN HUMANS

**19**

OF WHICH  
CONTROLLED

**111**

IN ANIMALS

**135**

IN THE LAB

Figures from the IHR study database · Last updated 2026-10-15

## How to Read This Dossier

**ESTABLISHED**

measured in humans, with a comparison group

**PLAUSIBLE**

supported by mechanism, animal studies or observation

**HYPOTHESIS**

a likely connection that still needs to be tested

Centella Asiatica (Gotu Kola) at a Glance

**ORIGIN:**  
Centella asiatica, also referred to in the literature as Gotu Kola, is a plant whose extracts are primarily associated with wound healing, skin care and vascular protection. As triterpenes the material lists asiaticoside and madecassoside as well as their aglycones asiatic acid and madecassic acid. An analytical study describes Centella asiatica as an Ayurvedic herb with potential applications in mental health and cognitive function.

**EVIDENCE BASE:**  
631 evaluated studies · 19 controlled human trials · 55 observational studies · 36 reviews · 111 animal studies · 99 cell-culture studies

- STRONGEST EVIDENCE:**
- **Skin:** In a randomised controlled trial with 112 participants, 200 mg/day Centella asiatica extract over 12 weeks improved several wrinkle parameters, including mean wrinkle depth by 11.1 %.
  - **Skin:** and wound healing: In a randomised controlled trial with 60 volunteers with class-1 wounds, a spray film containing Centella asiatica leaf extract significantly lowered the overall PUSH score and exudate score.
  - **Arm function:** After open carpal-tunnel release, the QuickDASH score in 280 patients at six months was 18.54 with 1 % Centella asiatica extract versus 28.70 in the untreated control group (p < 0.04).
  - **Musculoskeletal system:** In a pilot study of 23 adults with temporomandibular disorder, pain-intensity score after one week fell significantly in the 500-mg group (p = 0.016) and also in the placebo group (p = 0.030).
  - **Skin:** dryness: In 159 patients with type-2 diabetes and dry skin, the reduction in SRRC at day 29 was greater under combined oral and topical extract than in the control group (p = 0.04); the combination was tested.

- LIMITATIONS:**
- In a randomised controlled trial with 153 breast-cancer patients undergoing radiotherapy, Centella asiatica showed no prophylactic effect on radiation dermatitis.
  - Almost all controlled human trials examine multi-ingredient preparations; the isolated contribution of Centella asiatica cannot be derived from them, and corresponding studies are still pending.
  - No evaluated study on gut and microbiome examined the composition or function of the intestinal flora; controlled trials with microbiological endpoints are still pending.

**ASSESSMENT:**  
Centella asiatica, referred to in the literature as Gotu Kola, shows effects in humans mainly on skin and wound healing, while the isolated contribution of the plant in the mostly tested multi-ingredient preparations remains open.

1. What Centella Asiatica Is

Centella asiatica, referred to in the German literature as Gotu Kola, is a plant whose leaves and derived extracts are under investigation. The triterpene glycoside **asiaticoside** is regarded in the literature as the principal constituent; its metabolite **asiatic acid** is described together with further triterpenes as the subject of dedicated studies. Reviews cover ethnobotany, phytochemistry, pharmacology and toxicity of the species. The preparations examined range from leaf extracts through ointments, masks, serums and spray films to oral extracts. Comparative studies on different extraction methods show that the extraction process itself already alters the compound profile of the extracts. Research therefore addresses not a single substance but a family of extracts.

For the evaluation of all studies the **diversity of forms** is decisive: orally and topically applied preparations differ in absorption and site of action, and the studies employ extracts with varying triterpene content. A second point concerns the **study level**. A substantial part of the literature works with cell cultures, including human cells, or with animal models. Such findings are preclinical and carry no implication for human use. Anyone reading the database must therefore first ask what was examined: cells, animals, healthy volunteers or patients with a defined condition. Only this classification makes results comparable across studies.

The key human studies and the most important reviews — by application area, with population, duration, preparation, outcome measure and result as reported in the original papers. Numbers appear only where the study states them.

Distribution of **controlled human trials** by application area — the numbers are not additive because one study may be assigned to several areas:

| APPLICATION AREA        | CONTROLLED TRIALS |
|-------------------------|-------------------|
| Safety and tolerability | 13                |
| Skin                    | 11                |
| Gut and microbiome      | 5                 |
| Metabolism              | 4                 |
| Fatigue and stress      | 2                 |
| Oxidative stress        | 2                 |
| Inflammatory processes  | 2                 |

| APPLICATION AREA | CONTROLLED TRIALS |
|------------------|-------------------|
| Oncology         | 2                 |

### Preparations, not the plant, are examined

The most frequently cited controlled study tests ointments for the prevention of radiation-induced skin inflammation in breast-cancer patients. In this study Centella asiatica is a component of a herbal ointment mixture; a contribution of the single substance cannot be derived from it. The same applies to further frequently cited human studies: masks, serums and spray films additionally contain panthenol, Galactomyces ferment filtrate or other components, and some studies compare Centella preparations directly with other skin-care products. What has actually been tested in humans is therefore predominantly a finished product and not a defined active substance.

For practice this means that results cannot be transferred directly between preparations. An extract with a different triterpene profile, a different concentration or a different vehicle may produce a different result, and the studies report these details inconsistently. The obvious consequence is not a devaluation of the substance but a narrower question: which preparation was tested with which marker, in which population, over which period. Precisely these details are missing from many summaries, and that is why citation frequency here is not a measure of reliability.

## 2. What the Studies Show in Detail

### Skin

In a randomised controlled trial in 153 breast cancer patients undergoing radiotherapy, it was examined whether three different herbal creams with extracts from Centella asiatica, Cucumis sativus and Thunbergia laurifolia as well as a commercial moisturising cream can prevent an acute skin reaction. The participants were randomised into five groups, one group remained untreated. The creams were applied once daily from the first radiotherapy session until one month after the end of radiotherapy; the skin was assessed weekly by a radio-oncologist. Neither the herbal creams nor the moisturising cream could reduce the severity of the dermatitis or delay its onset; the cream with Cucumis sativus showed a limited benefit <sup>1</sup>. In this study, Centella asiatica showed no prophylactic effect on radiation dermatitis.

A multicentre, randomised, controlled study in 60 volunteers with clean-contaminated wounds (class 1) examined a polymeric spray-film material with Centella asiatica leaf extract containing triterpenes: asiatic acid, madecassic acid, asiaticoside and madecassoside in concentrations of 0.20±0.02 mg/ml, 0.16±0.01 mg/ml, 0.32±0.03 mg/ml and 0.10±0.00 mg/ml respectively. The pH value was 5.5±0.01, the viscosity 33±4 cP; the product was stable for six months at 30±2 °C and 40±2 °C at 75±5 % relative humidity. The 30 participants in the test group and 30 in the control group were assessed on days 0, 3, 5 and 7 with the Pressure Ulcer Scale for Healing (PUSH Tool). The tested product significantly reduced the overall PUSH score and the exudate score, indicating improved wound healing <sup>3</sup>.

A randomised, double-blind, placebo-controlled study in 24 patients aged 50 to 80 years with squamous cell or basal cell carcinoma examined the oral preparation Cicaglocal, a supplement with bromelain, Centella asiatica, hyaluronan, vitamins and minerals after Mohs micrographic surgery. Treatment was given postoperatively; erythema reduction, Early Healing Score (EHS), complete healing and patient and physician satisfaction were assessed on day 7 and 14. Cicaglocal significantly improved erythema score, EHS, complete healing score and satisfaction values compared with placebo <sup>4</sup>. As this is a combination preparation, the contribution of Centella asiatica alone cannot be derived from this study.

In a double-blind, block-randomised controlled study in 60 older adults with incontinence-associated dermatitis in intensive and semi-intensive care units, the control group (n = 30) received a structured care programme plus zinc oxide with petroleum jelly, while the experimental group (n = 30) received the same programme plus a herbal preparation of Centella asiatica and Aloe vera. The intervention lasted 7 days; risk and severity of dermatitis, skin surface pH and skin hydration were measured. The groups differed significantly (p < 0.001); the experimental group showed markedly lower risk values <sup>8</sup>; as the preparation combined Centella asiatica and Aloe vera, the contribution of Centella asiatica alone cannot be derived from this study. A pilot study with 20 older patients (10 per group) with the same comparative design reported that both products effectively prevented and treated dermatitis, reduced risk and severity, improved skin hydration and maintained a slightly acidic skin pH <sup>15</sup>.

A randomised controlled study in 280 patients with carpal tunnel syndrome after open carpal tunnel release surgery examined a cream with 1 % Centella asiatica extract applied to the wrist for six months after suture removal versus an untreated control group (n = 140 each). Vancouver Scar Scale (VSS), QuickDASH functional score and VAS satisfaction were assessed preoperatively and after 1, 3 and 6 months. After 6 months the mean QuickDASH score was 18.54 (range 0.00–63.64; SD 17.4) in the intervention group versus 28.70 ± 12 (range 2.27–40.91) in the control group (p < 0.04); mean VAS satisfaction was 1.46 ± 1.95 (range 0–4) versus 2.48 ± 1.02 (range 0–4) <sup>16</sup>.

A randomised, double-blind study in 60 subjects examined a panthenol-enriched mask with Centella asiatica extract (madecassoside) and bisabolol after non-ablative fractional laser treatment with 1550 and 1927 nm. The mask group showed significantly lower erythema and hyperpigmentation indices on days 3, 7 and 14, higher sebum content on days 7 and 14, higher stratum corneum hydration on days 3, 7 and 14 and significantly reduced transepidermal water loss (TEWL) on days 3, 7 and 14 <sup>37</sup>. A two-centre randomised controlled study in 64 patients with mild to moderate rosacea (mask n = 47, control n = 17) tested a Centella asiatica repair mask three times weekly for 6 weeks in addition to 50 mg oral minocycline twice daily and a moisturising cream. After 3 and 6 weeks, Investigator Global Assessment (IGA), skin dryness, facial redness and lesion severity improved significantly in the mask group (p < 0.05); the change in redness intensity was significantly greater than in the control group (p = 0.037), with no adverse events <sup>6</sup>.

A randomised, double-blind, placebo-controlled study in 112 female participants received 200 mg/day Centella asiatica extract or placebo for 12 weeks. Skin wrinkle parameters were quantified with a three-dimensional skin imaging system (PRIMOS®); hydration, TEWL, elasticity and skin colour were also measured. After 12 weeks the extract group showed significant improvements in several wrinkle parameters versus baseline: average wrinkle depth –11.1 %, mean depth of the deepest wrinkle –14.4 %, maximum wrinkle depth –13.3 %, total wrinkle volume –13.7 %, surface roughness (Ra) –10.4 % <sup>7</sup>. The review

articles on skin disorders and wound healing place these findings in the context of mechanisms: Centella asiatica and its triterpenes asiaticoside, madecassoside and their aglycones asiatic acid and madecassic acid act via NF- $\kappa$ B, TGF- $\beta$ /Smad, MAPK, Wnt/ $\beta$ -catenin and STAT signalling pathways in in-vitro and in-vivo studies<sup>19</sup>; a systematic review identified four clinical studies on wound contraction, granulation, healing and bleeding time, re-epithelialisation, VAS scores, skin erythema and wound appearance<sup>18</sup>. What is lacking are independent, blinded studies that isolate the individual contribution of Centella asiatica from the combination preparations.

### Inflammatory Processes

A three-arm, prospective, double-blind, randomised controlled study in 159 patients with type 2 diabetes and dry skin examined the combination of oral and topical Centella asiatica extract. The groups received oral 2  $\times$  1.100 mg plus 1 % ointment topically, oral placebo plus topical Centella asiatica, or placebo orally and topically. Dryness assessment was performed on days 1, 15 and 29; measurement of N(6)-carboxymethyllysine (CML), interleukin-1 $\alpha$  (IL-1 $\alpha$ ) and superoxide dismutase (SOD) activity on days 1 and 29. With well-controlled blood glucose, the percentage reduction in SRRC on day 29 was greater in the combination group than in the control group ( $p = 0.04$ )<sup>2</sup>. The study examines the combination, not the single substance.

The systematic review on wound healing describes an anti-inflammatory effect of Centella asiatica, observed as reduction of interleukin-1 $\beta$  (IL-1 $\beta$ ), interleukin-6 (IL-6), tumour necrosis factor  $\alpha$  (TNF $\alpha$ ), prostaglandin E2 (PGE2) and cyclooxygenase<sup>18</sup>. The comprehensive review on ethnobotany, phytochemistry and pharmacology places inflammation-related effects within the broad spectrum of the plant and names neuroprotective, wound-healing and antidiabetic activities as the best studied<sup>42</sup>. A further review on Centella asiatica and its triterpenes reports anti-inflammatory, antioxidant and anti-apoptotic effects as well as improvement of mitochondrial function and calls for further clinical studies<sup>17</sup>.

A review on the cardiovascular protective effects of Centella asiatica and its triterpenes (asiatic acid, asiaticoside, madecassic acid, madecassoside) evaluated studies from 2004 to 2018 and reports potential therapeutic effects in cardiovascular diseases and related conditions, supported by in-silico, in-vitro, in-vivo and clinical studies<sup>39</sup>. A review on hypoxia-induced neuroinflammation in Alzheimer's disease describes Centella asiatica as one of the natural substances with neuroprotective effects in various models of central nervous system disorders and discusses the hypoxia-neuroinflammation pathway as a target<sup>28</sup>. These works provide mechanistic and review evidence, not new controlled data on inflammatory endpoints in humans. What is lacking are clinical studies that measure inflammatory markers under standardised Centella asiatica monotherapy.

### Gut and Microbiome

as a food supplement for glycaemic and lipid control. The primary endpoint was glycated haemoglobin (HbA1c), secondary endpoints fasting plasma glucose, LDL cholesterol and adverse events. After 6 months an unadjusted group difference in HbA1c was observed ( $p = 0.006$ ); however, in the prespecified adjusted analysis (ANCOVA with baseline HbA1c, diabetes duration and sulfonylurea use) no group differences were found for HbA1c, fasting plasma glucose or LDL-C. The adjusted LDL-C analysis was not significant ( $p = 0.536$ ); the lipid findings are exploratory. Centella asiatica was well tolerated; the most common events were mild, transient gastrointestinal symptoms (5/34)<sup>13</sup>.

The comprehensive review on ethnobotany, phytochemistry and pharmacology of Centella asiatica names gastrointestinal disorders as one of the traditional areas of use and describes effects on the gastrointestinal system in preclinical and clinical studies, without allowing derivation of a microbiological effect<sup>42</sup>. A review on the pharmacokinetic and pharmacological properties of asiaticoside, a pentacyclic triterpenoid saponin, reports low biotoxicity, high blood-brain barrier permeability measured in a preclinical model and diverse pharmacological effects including anti-inflammatory and cancer-related properties; this permeability has not been investigated in humans, and pharmacokinetics differed between species<sup>38</sup>. For the gut and microbiome, the evaluated works contain no studies that examine the composition or function of the intestinal flora under Centella asiatica. What is lacking are controlled studies with microbiological endpoints.

### Musculoskeletal System

A randomised, double-blind, placebo-controlled pilot study in 23 adults with acute temporomandibular disorder examined the Centella asiatica extract ECa233. Participants were assigned to four groups: ibuprofen as positive control, two test groups with 250 mg or 500 mg ECa233 and placebo as negative control. All took the capsules twice daily for 14 days. Pain intensity, range of motion of the mandible and pressure pain of the masticatory muscles and temporomandibular joint were recorded at baseline and after 7 and 14 days. One week after the intervention the pain intensity score decreased significantly in the 500 mg group ( $p = 0.016$ ) and in the placebo group ( $p = 0.030$ ), but not in the remaining groups. The 500 mg group showed the highest percentage reduction in self-reported pain intensity and pressure pain at the temporomandibular joint compared with the other groups ( $p > 0.050$ ). On day 14 no significant differences were found between the four groups<sup>5</sup>.

The authors conclude that orally administered ECa233 has the potential to alleviate pain symptoms and improve function in acute temporomandibular disorder<sup>5</sup>. The small sample size of 23 participants and the absence of group differences on day 14 limit the strength of the findings. What is lacking is a larger study with longer follow-up and a dose-response examination that separates the effect of Centella asiatica from that of concomitant measures.

### Cognition and Psyche

A systematic scoping review following JBI methodology and PRISMA-ScR examined the therapeutic potential of Gotu Kola (Centella asiatica), phosphatidylcholine and taurine in mood disorders. The review assessed whether the available evidence is sufficient to support meta-analyses<sup>9</sup>. The three human studies on Gotu Kola comprise a total of 91 participants; the work reports no pooled effect estimates.

An analytical study characterising Centella asiatica extracts by mass spectrometry identified or tentatively identified 117 compounds and quantified 24 phytochemicals in different extracts. The authors name Centella asiatica as an Ayurvedic herb with potential applications in mental health and cognitive function and point out that phytochemical composition determines bioactivity and reproducibility of laboratory studies and clinical trials<sup>20</sup>. The review on hypoxia-induced neuroinflammation in Alzheimer's disease discusses Centella asiatica as a potential therapeutic agent in Alzheimer's disease or dementia via the hypoxia-neuroinflammation pathway, without providing its own clinical data on cognitive endpoints<sup>28</sup>. What is lacking are controlled studies with standardised cognitive or mood endpoints and adequate participant numbers.

## Metabolism

A randomised, placebo-controlled study in 60 healthy adults over 56 days examined topical formulations with plant extracellular vesicles and growth factors. Group A received placebo, group B a base formula with 0.1 % caffeine and panthenol, group C the base plus recombinant Fc-fusion IGF-1 (rIGF-1) and FGF-7 (rFGF-7), group D the base plus *Centella asiatica* and ginger EVs, group E the base plus rIGF-1, rFGF-7 as well as *Centella asiatica* and ginger EVs. Parameters were recorded on days 14, 28, 42 and 56. Group E showed rapid onset of action and significant superiority over control and other groups: a time-dependent reduction in excess sebum of 67 % on day 56, a mean cumulative hair length change of nearly 3.9 cm on day 56, a mean weekly growth rate of 1.4 cm/week, an increase in hair thickness of 19 µm and hair density of 17 % on day 56, as well as a halving of hair loss <sup>10</sup>.

A second randomised, double-blind, placebo-controlled study in 60 healthy adults aged 18 to 60 years over 56 days examined a topical essence with *Centella asiatica* extracellular vesicles (*C. asiatica* EV) and recombinant long-acting IGF-1 and FGF-7. The five groups followed the same design: placebo, base formula with 0.1 % caffeine and panthenol, base plus rIGF-1 and rFGF-7, base plus *C. asiatica* EV, and base plus rIGF-1, rFGF-7 and *C. asiatica* EV. Application was once daily for 56 days; sebum content, hair length, thickness and density as well as hair loss were measured on days 14, 28, 42 and 56. The formulation with *C. asiatica* EV and growth factors was the most effective; all parameters differed significantly from placebo on day 56 <sup>14</sup>.

Both studies examine combinations of *Centella asiatica* EVs and growth factors; the isolated contribution of the *Centella asiatica* component cannot be derived from the reported group comparisons. What is lacking are studies that test *Centella asiatica* alone against placebo and track the effect on sebum production and hair growth beyond the 56 days.

## Safety and Tolerability

An overview article on many agents reports: pentoxifylline (RR = 1.69; 95 % CI 1.34–2.14), micronised purified flavonoid fraction (RR = 1.68; 95 % CI 1.23–2.29) and sulodexide (RR = 1.61; 95 % CI 1.16–2.23) significantly increased ulcer healing. Only calcium dobesilate (RR = 0.30; 95 % CI 0.14–0.64) significantly reduced pain versus control. Calcium dobesilate (RR = 0.22; 95 % CI 0.08–0.63) and *Centella asiatica* (RR = 0.30; 95 % CI 0.11–0.81) significantly reduced the sensation of heaviness. Red vine leaf extract (RR = 0.62; 95 % CI 0.44–0.87) was associated with fewer adverse events <sup>11</sup>.

An open-label phase-1 study with two dosing sequences in healthy Thai volunteers examined the safety and pharmacokinetics of ECa 233, a standardised *Centella asiatica* extract, as single and multiple doses under fasting conditions. Plasma concentrations of the parent compounds and their acid metabolites were measured; tolerability was assessed via physical examination, vital signs, clinical laboratory tests and adverse events. The pharmacokinetics of ECa 233 in humans did not match the preclinical animal model: maximum plasma concentration and area under the curve were very low for madecassoside and asiaticoside, while the metabolites madecassic acid and asiatic acid showed higher values. After repeated dosing, accumulation of the active metabolites was likely; the asiatic acid profile showed a twofold increase in C<sub>max</sub> and AUC(0-t) when the dose was raised from 250 to 500 mg ECa 233 <sup>22</sup>.

The comprehensive review on ethnobotany, phytochemistry, pharmacology and toxicity of *Centella asiatica* reports a broad spectrum of pharmacological effects, some confirmed in preclinical and clinical studies, and notes advances in nanotechnology, toxicology and clinical study reports with indications of gaps in current research <sup>40</sup>. A comparative review of extraction methods describes the influence of conventional and modern procedures (microwave-, ultrasound-assisted and subcritical water extraction) on bioactive compounds and antimicrobial activity in vitro and in vivo <sup>41</sup>. Long-term safety data under chronic use and a systematic recording of adverse events in controlled studies remain open.

## Oxidative Stress

A randomised, double-blind, placebo-controlled study in 80 men and women aged 45 to 65 years with baseline macular pigment optical density (MPOD) values between 0.2 and 0.4 examined the effect of 6-month supplementation with a standardised *Centella asiatica* extract (CA-HE50). Participants received 300 mg/day CA-HE50 (n = 40) or placebo (n = 40). MPOD was measured at baseline and on days 60, 120 and 180; the primary endpoint was the change in MPOD from baseline to day 180. Safety was recorded via adverse events, vital signs and clinical laboratory tests. On day 180 a statistically significant increase in MPOD versus placebo was observed in the right eye, the left eye and the mean of both eyes (all p < 0.001). Significant between-group differences also existed on day 120, indicating a time-dependent improvement. The proportion of responders was significantly higher in the CA-HE50 group than in the placebo group (p < 0.001). CA-HE50 was well tolerated, with no serious adverse events <sup>12</sup>.

MPOD is regarded as a nutrition-dependent biomarker for the antioxidant status of the macula. The study shows an improvement in this biomarker under CA-HE50 but does not measure functional visual performance or systemic oxidation markers. Studies that examine the relationship between MPOD change and clinical vision endpoints as well as transferability to other populations remain open.

## Further Investigations

The randomised controlled study already mentioned under Skin, conducted in 280 patients after carpal-tunnel release surgery, tested a cream containing 1 % *Centella asiatica* extract against no intervention. The study combines scar-related and functional endpoint measurements and shows an advantage for the treated group.

The review on the pharmacological effects of *Centella asiatica* on skin disorders reports therapeutic effects on acne, burns, atopic dermatitis and wounds via NF-κB-, TGF-β/Smad-, MAPK-, Wnt/β-catenin- and STAT signalling pathways in in-vitro and in-vivo studies and states that additional rigorously controlled long-term studies are required to confirm the full potential <sup>19</sup>. The systematic review on wound healing identified four clinical studies and names improved angiogenesis via stimulation of collagen I, fibroblast growth factor (FGF) and vascular endothelial growth factor (VEGF) as well as an anti-inflammatory effect via reduction of IL-1β, IL-6, TNFα, PGE2 and cyclooxygenase as possible mechanisms <sup>18</sup>.

A review on topical applications of *Centella asiatica* in wound healing describes that innovative delivery systems such as hydrogels, nanostructures or microneedles can accelerate wound healing, reduce wound size and improve recovery times in various wound types including diabetic ulcers and burns <sup>21</sup>. The review on asiaticoside summarises that the compound is degraded via a first-order reaction and exhibits low biotoxicity; crossing the blood-brain barrier has been shown preclinically but has not been investigated in humans <sup>38</sup>. What is missing are independent studies on the individual dosage forms and on rare adverse effects.

Overall Picture

The evidence is strongest where individual, clearly defined preparations were tested against placebo or control and the endpoints are objectively measurable. It is thin where combination products were used, because the contribution of Centella asiatica cannot be isolated <sup>4 10 14</sup>, and where the case numbers are small <sup>5 15</sup>. No studies with microbiological endpoints exist for the gut and microbiome. The review articles provide consistent mechanistic indications of anti-inflammatory, antioxidant and collagen-synthesis-promoting effects <sup>19 18 21</sup>, but the translation of these mechanisms into clinical endpoints remains open.

Methodology of the Evidence Base

The evaluated works comprise randomised controlled trials with case numbers between 20 and 280 participants, predominantly double-blind and placebo-controlled, with treatment durations from 7 days to 6 months. The endpoints range from clinical scores (PUSH, VSS, QuickDASH, IGA, EHS) through instrumental skin measurements (TEWL, sebum content, moisture, wrinkle parameters using PRIMOS®) and laboratory values (HbA1c, LDL-C, CML, IL-1α, SOD, MPOD) to patient and physician satisfaction. In addition there is a phase-1 study on safety and pharmacokinetics in healthy volunteers <sup>22</sup>, a network meta-analysis <sup>11</sup> and several systematic reviews <sup>18 19 21 38 39 40 41 42</sup>. Systematically missing are studies that test Centella asiatica as a single substance against placebo, long-term data beyond 6 months, investigations in children and pregnant women, and studies with microbiological or functional vision endpoints.

3. How Robust the Research Is

Animal and cell-culture studies are strongly represented among the evaluated works. In humans there are 55 observational and 19 controlled studies. Among the controlled works the application area **Safety** leads the list, followed by **Skin**; thereafter come gut and metabolism in small groups. Individual controlled works concern fatigue, antioxidant questions, inflammation, oncology, cognition and the musculoskeletal system. A focus of the human literature therefore lies on tolerability and skin care, not on cognitive or internal-medicine endpoints.

Methodologically it is noticeable that the field possesses robust review articles: a systematic review with network meta-analysis exists for wrinkles, and a systematic review for wound healing. This is the strongest available evidence level in this corpus. The controlled individual studies, by contrast, are predominantly small, short and conducted on heterogeneous preparations; many test combination products in which Centella asiatica is only one of several components. Safety studies are comparatively frequently represented, which speaks for a field that systematically records tolerability. The strong reception of review and mechanism works simultaneously shows that perception of the substance runs through summaries rather than through primary human data.

4. What Is Frequently Claimed — and What the Data Support

| STATEMENT                    | EVIDENCE BASE                                                                                                                                                     |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wound Healing                | Several controlled studies address acute wounds, predominantly in combination preparations such as spray films or oral products. There are also animal and cell   |
| Wrinkles and Skin Ageing     | Here, with a systematic review including a network meta-analysis, the strongest level of evidence in the corpus is present. The included studies examine differer |
| Cognition and Memory         | There is only one controlled study in humans in this area. The remaining literature is animal- and cell-based; memory findings come from mouse models. These s    |
| Type-2 Diabetes and Dry Skin | Vier kontrollierte Arbeiten betreffen den Metabolism. One of them examines an oral and a topical application in three study arms. The groups studied are small; s |

5. Profile: Molecule and Charge

Centella asiatica (Gotu Kola) is not a single molecule but a **mixture** — there is no molecular formula and no fixed molecular mass. What can be described are functional groups, charge behaviour and redox properties; that is precisely what the next section addresses.

6. Charge, Electrons, Radicals

The charge of the extract has not been measured in humans; the evidence contains zeta potentials of formulations: a lipid-based nanocarrier loaded with Centella asiatica showed  $-10.27 \pm 1.37$  mV at a particle size of approximately  $37.91 \pm 1.55$  nm <sup>24</sup>, another preparation  $-24.9 \pm 0.011$  mV at  $127.833 \pm 8.280$  nm <sup>32</sup>. Both values describe the particles, not the extract. On human cadaver skin the nanoscale architecture led to deeper and more uniform penetration, not

the surface charge or hydrophobicity<sup>30</sup>. Cation exchange of the substance has not been investigated in the evidence; likewise, a measurement of electron transfer in humans is absent.

Radicals and redox: In humans, *C. asiatica* and araliadiol were observed to suppress cell death and the formation of reactive oxygen species<sup>25</sup>. In human skin fibroblasts a triterpene pretreatment attenuated UVB-induced formation of ROS and malondialdehyde and reduced the UVB-related decrease in glutathione<sup>29</sup>. In animal studies a CAW treatment increased Nrf2 and further NRF2 target genes in the hippocampus (haem oxygenase-1, NAD(P)H quinone dehydrogenase 1)<sup>31</sup>. In human tissue ROS levels and the transcription of antioxidant genes were measured in HaCaT and HEK293T cells<sup>27</sup>; madecassoside effects were abolished by an intracellular Ca2+ chelator (BAPTA) and inhibitors of AMPK, mTOR and ERK<sup>26</sup>. It remains to be clarified whether charge and radical formation of the extract can be captured directly in humans.

## 7. Interactions with Other Substances

With which other substances on the platform this substance has been **jointly** investigated or discussed in human studies and reviews — combination, comparison or shared mechanism of action. The number indicates studies in which both appear.

| SUBSTANCE                         | SHARED STUDIES | OF WHICH CONTROLLED IN HUMANS |
|-----------------------------------|----------------|-------------------------------|
| Chronic Inflammation              | 34             | 2                             |
| Stress, Cortisol and Inflammation | 17             | 2                             |
| Adaptogens                        | 14             | 4                             |
| Turmeric and Curcumin             | 13             | 1                             |
| Hyaluronic Acid (oral)            | 7              | 1                             |
| Art Therapy                       | 7              | 0                             |
| Vitamin C                         | 4              | 0                             |
| Quercetin                         | 4              | 0                             |
| Ginger                            | 3              | 1                             |
| Zinc                              | 3              | 2                             |

Mainly combination approaches are described. In a controlled human study 30 participants received a care intervention with a herbal preparation of *Centella asiatica* and *Aloe vera*; skin hydration was higher than in the control group with zinc oxide and petroleum jelly ( $p < 0.001$ )<sup>8, 8, 8</sup>. Because both plants were tested together, the effect cannot be attributed to the single substance. A further controlled study in 60 healthy adults ran five groups, including a base formula with *C. asiatica* EV<sup>14</sup>, and describes plant EVs with growth factors as a synergistic strategy<sup>14</sup>.

Several observations support enhancement by accompanying substances. Simultaneous administration of the TLR4 inhibitor TAK-242 strengthened the protective effects of asiaticoside<sup>33</sup>. Chitosan and lyophilised *Centella asiatica* extract jointly blocked hyaluronidase in an in-vitro model<sup>23</sup>. According to this work asiaticoside shows synergistic capabilities with other biomaterials<sup>35</sup>. In venous ulcers supplementation together with ulcer management improved microcirculation and healing rate<sup>34</sup>. The evaluated studies say nothing about CYP enzymes, absorption or plasma-protein binding; it remains open whether combination effects act additively or synergistically.

## 8. Overdosage, Tolerability, Limits

In controlled human studies no striking differences in adverse effects appeared under *Centella asiatica*: in dry skin of type-2 diabetes patients systemic and topical side effects did not differ significantly between the groups<sup>2</sup>. One study reported 10 adverse events for *C. asiatica* and 35 for tretinoin<sup>36</sup>. In a wound study with a *C.-asiatica*-containing polymer spray-film solution mean healing times were 4.6±1.1 days (test group) and 4.87±1.0 days (control group), without adverse effects<sup>3</sup>. In a rosacea study with a *C.-asiatica* repair mask no adverse events were reported in either group<sup>6</sup>.

Over 180 days safety was examined by recording adverse events, vital signs and clinical laboratory values; CA-HE50 was well tolerated, without serious adverse events or clinically relevant safety concerns<sup>12 12</sup>. A randomised study in Thailand examined safety and efficacy of *C. asiatica* as a food supplement in type-2 diabetes<sup>13</sup>. Proven: none of the present studies names maximum doses, upper limits or contraindications. Hypothesis: the reported tolerability applies to the tested preparations and dose ranges, not to arbitrarily high doses. What would need to be examined is from which dose adverse effects occur more frequently.

## 9. The Most Robust Studies

Ordered by strength of evidence, not by familiarity. The complete evaluation comprises considerably more studies; the most robust ones are listed here.

### Controlled Studies in Humans

- <sup>1</sup> Prophylaxis of Radiation-Induced Dermatitis in Patients With Breast Cancer Using Herbal Creams: A Prospective Randomized Controlled Trial (2020)
- <sup>2</sup> Oral and Topical Centella asiatica in Type 2 Diabetes Mellitus Patients with Dry Skin: A Three-Arm Prospective Randomized Double-Blind Controlled ... (2020)
- <sup>3</sup> Wound healing efficacy of a polymeric spray film solution containing Centella asiatica leaf extract on acute wounds (2023)
- Evaluation of the Efficacy and Safety of a Panthenol-Enriched Mask for Skin Barrier Recovery After Facial Laser Treatment: Results of a Double-Blind ... (2025)
- <sup>4</sup> Investigating the Efficacy and Safety of Oral Cicaglocal on Wound Healing After Mohs Surgery in Patients With Skin Cancer: A Randomized ... (2025)
- <sup>5</sup> Efficacy of Centella asiatica on mitigating temporomandibular pain and improving functionality: a randomized, double blind, pilot clinical trial (2025)
- <sup>6</sup> A two-center randomized controlled trial of a repairing mask as an adjunctive treatment for mild to moderate rosacea (2024)
- <sup>7</sup> A Randomized, Double-Blind, Placebo-Controlled Trial Assessing the Effects of Oral Centella asiatica Extract on Skin Aging-Related ... (2026)
- <sup>8</sup> Care of incontinence-associated dermatitis in older adults: A randomized controlled trial comparing zinc oxide-petroleum jelly and centella ... (2026)
- <sup>9</sup> Therapeutic Potential of Gotu Kola (Centella asiatica), Phosphatidylcholine, and Taurine in Mood Disorders: A Systematic Scoping ... (2026)
- A Dual-Species Plant-derived Extracellular Vesicle and Growth Factors Formulation for Hair and Scalp Care: A Randomized, Placebo-controlled Study (2026)
- <sup>11</sup> Pharmacological interventions to treat chronic venous disease: A network meta-analysis (2026)
- <sup>12</sup> Effects of Long-Term Supplementation with Centella asiatica (L.) Urb. Extract (CA-HE50) on Macular Pigment Optical Density: A ... (2026)
- <sup>13</sup> Efficacy and safety of Centella asiatica (L.) Urb. [Apiaceae] as a dietary supplement for glycemic control and lipid regulation in ... (2025)
- <sup>14</sup> A 56-Day Randomized, Double-Blinded, and Placebo-Controlled Clinical Assessment of Scalp Health and Hair Growth Parameters with a Centella asiatica ... (2025)
- <sup>15</sup> The Effects of a Nursing Program Applying Zinc Oxide Mixed with Petroleum Jelly and Centella Asiatica Mixed with Aloe Vera on Skin Indicators Among ... (2025)
- <sup>16</sup> The effect of Centella Asiatica cream on scar development in patients who underwent open carpal tunnel release surgery (2023)

### Observational Studies in Humans

- <sup>17</sup> Therapeutic Potential of Centella asiatica and Its Triterpenes: A Review (2020)
- <sup>18</sup> A Systematic Review of the Effect of Centella asiatica on Wound Healing (2022)
- <sup>19</sup> Pharmacological Effects of Centella asiatica on Skin Diseases: Evidence and Possible Mechanisms (2021)
- <sup>20</sup> Integration of mass spectral fingerprinting analysis with precursor ion (MS1) quantification for the characterisation of botanical extracts ... (2020)
- <sup>21</sup> Topical Application of Centella asiatica in Wound Healing: Recent Insights into Mechanisms and Clinical Efficacy (2024)
- <sup>22</sup> Safety and Pharmacokinetics of Standardized Extract of Centella asiatica (ECa 233) Capsules in Healthy Thai Volunteers: A Phase 1 Clinical Study (2019)
- <sup>23</sup> Chitosan-Based Hydrogels for Controlled Delivery of Asiaticoside-Rich Centella asiatica Extracts with Wound Healing Potential (2023)

Proven first is the structure of the corpus: 19 controlled and 55 observational studies in humans stand against a majority of basic, animal and cell culture studies. The strongest level of evidence is reached by a systematic review with network meta-analysis on wrinkles and a systematic review on wound healing. In controlled studies no noticeable differences appeared in adverse effects; one study reported 10 adverse events for *C. asiatica* and 35 for tretinoin. None of the present studies names maximum doses, upper limits or contraindications.

Plausible is that the reported tolerability applies to the tested preparations and dose ranges, not to arbitrarily high doses. **Hypothesis:** Equally plausible is that results are not readily transferable between preparations, because an extract with a different triterpene profile, a different concentration or a different vehicle may produce a different result. This does not imply any devaluation of the substance, but a narrower question: which preparation was tested with which marker, in which cohort, over which period.

A study would have to clarify whether properties of the extract can be captured directly in humans; only formulations, not the extract itself, have been investigated so far. It would also be necessary to examine from which dose adverse effects occur more frequently and whether combination effects act additively or synergistically. Finally, a study would be required that tests a defined Centella asiatica preparation with a defined marker in a sufficiently large cohort over a fixed period, so that the contribution of the plant can be separated from that of the accompanying substances.

## 10. Summary

In humans the controlled data cited here concern skin, wound healing and arm function after surgery. Several randomised controlled trials report improvements: 200 mg extract daily reduced several wrinkle parameters over twelve weeks, a 1 % cream improved the QuickDASH score after open carpal-tunnel release surgery compared with an untreated control group, and a spray film with leaf extract lowered total PUSH score and exudate score in class 1 wounds. Positive findings on repair masks in rosacea and after fractional laser treatment are added. Some of these studies test multi-substance preparations, so the contribution of the plant remains open there.

Plausible: The systematic reviews place the skin and wound findings within mechanisms. Centella asiatica and its triterpenes asiaticoside, madecassoside and their aglycones asiatic acid and madecassic acid act in in-vitro and in-vivo studies via NF- $\kappa$ B, TGF- $\beta$ /Smad, MAPK, Wnt/ $\beta$ -catenin and STAT signalling pathways. The systematic review on wound healing describes an anti-inflammatory effect observed as reduction of IL-1 $\beta$ , IL-6, TNF $\alpha$ , PGE2 and

cyclooxygenase. **Hypothesis:** If the triterpenes are the carriers of these effects, a standardised monotherapy could make the findings from the combination preparations testable. A review on cardiovascular protective effects evaluated studies from 2004 to 2018 and reports potential therapeutic effects in cardiovascular diseases.

The next examination would have to employ a standardised extract as monotherapy, blinded and controlled, with defined dose and sufficient participant number. For inflammatory markers, measurements under standardised monotherapy would need to be clarified; for cognition and mood, controlled studies with standardised endpoints. The scoping review on gotu kola, phosphatidylcholine and taurine in mood disorders examined whether the evidence suffices for meta-analyses; the three human studies on gotu kola comprise 91 participants in total. For gut and microbiome, controlled studies with microbiological endpoints are still outstanding. A dose-response examination could additionally clarify whether the findings on temporomandibular disorder extend beyond the pilot study with 23 participants.

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## 11. What Remains Open

- **Standardisation:** Which extract with which triterpene marker was used in the individual human studies, and how strongly do the profiles differ? This information would first allow results to be compared between studies.
- **Single-substance testing:** A controlled study on a standardised extract without further active substances, with a defined endpoint, would show which share of observed effects is attributable to the plant itself.
- **Oral use:** Whether oral preparations reach other endpoints in humans than topical ones remains open. The available studies examine both routes only in small groups.

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## 12. Further Paths

Topics, modes of action and chains in which this substance occurs — for all who wish to look beyond the substance.

- Interaction network

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## Frequently Asked Questions

### How reliable is the human literature on *Centella asiatica* overall?

55 observational and 19 controlled studies are available in humans. The controlled studies focus on safety and skin, are predominantly small and test different, frequently combined preparations. The strongest level of evidence in the corpus consists of systematic reviews on wound healing and wrinkles, one of them with network meta-analysis.

### Are skin applications the best studied?

By the number of controlled studies, yes: skin and safety top the list. However, these studies almost exclusively test finished preparations, often in comparison with other care products. They therefore reflect tolerability and product behaviour, not the contribution of an individual plant substance.

### Are there indications of cognitive effects in humans?

Frequently cited are animal experimental memory studies and reviews on neuroinflammatory mechanisms. In humans this is contrasted by a single controlled study in the field of cognition. Mechanistic plausibility is therefore present; testing in humans is only at the beginning here.

## Sources

- 1 Prophylaxis of Radiation-Induced Dermatitis in Patients With Breast Cancer Using Herbal Creams: A Prospective Randomized Controlled Trial  
Thanthong S, Nanthong R, Kongwattanakul S, Laebua K, Trirussapanich P, Pitiporn S et al. · 2020
- 2 Oral and Topical Centella asiatica in Type 2 Diabetes Mellitus Patients with Dry Skin: A Three-Arm Prospective Randomized Double-Blind Controlled Trial  
Legiawati L, Bramono K, Indriatmi W, Yunir E, Setiati S, Jusman SWA et al. · 2020
- 3 Wound healing efficacy of a polymeric spray film solution containing Centella asiatica leaf extract on acute wounds  
Changsan N, Srichana T, Atipairin A, Sawatdee S · 2023
- 4 Investigating the Efficacy and Safety of Oral Cicaglocal on Wound Healing After Mohs Surgery in Patients With Skin Cancer: A Randomized, Double-Blinded, Placebo-Controlled Clinical Trial  
Asilian A, Mohammadian P, Mahram H, Shahriarirad R, Bigham M · 2025
- 5 Efficacy of Centella asiatica on mitigating temporomandibular pain and improving functionality: a randomized, double blind, pilot clinical trial  
Potewiratnanond P, Surarit R, Tantisira MH, Samaranyake L, Rotpenpian N, Wanasuntronwong A · 2025
- 6 A two-center randomized controlled trial of a repairing mask as an adjunctive treatment for mild to moderate rosacea  
Wang L, Zhang Y, Chen L, Yuan D, Feng X, Zheng J et al. · 2024
- 7 A Randomized, Double-Blind, Placebo-Controlled Trial Assessing the Effects of Oral Centella asiatica Extract on Skin Aging-Related Parameters in Middle-Aged Korean Women  
Hur N, Seo Y, Bae J, Kim YJ, Kim EJ, Choi YJ · 2026
- 8 Care of incontinence-associated dermatitis in older adults: A randomized controlled trial comparing zinc oxide-petroleum jelly and centella asiatica-aloe vera preparations  
Chaisomsee S, Banharak S, Sommana C, Tuntiyasawasdikul S, Sim-Im S, Ransinyo K et al. · 2026
- 9 Therapeutic Potential of Gotu Kola (Centella asiatica), Phosphatidylcholine, and Taurine in Mood Disorders: A Systematic Scoping Review  
Pedregosa BIC, Navarro JC, Baroque GAB, Sta Maria MIN, De Leon MAJ, Trivilegio MJH et al. · 2026
- 10 A Dual-Species Plant-derived Extracellular Vesicle and Growth Factors Formulation for Hair and Scalp Care: A Randomized, Placebo-controlled Study  
Chang T, Wu C, Huang H, Lu J, Chen Y, Kao P et al. · 2026
- 11 Pharmacological interventions to treat chronic venous disease: A network meta-analysis  
Nguyen AN, Ta KT, Chuang KJ · 2026
- 12 Effects of Long-Term Supplementation with Centella asiatica (L.) Urb. Extract (CA-HE50) on Macular Pigment Optical Density: A Randomized, Double-Blind, Placebo-Controlled Trial  
Baek HI, Kim I, Bae J, Kwon JE, Kang SC · 2026
- 13 Efficacy and safety of Centella asiatica (L.) Urb. [Apiaceae] as a dietary supplement for glycemic control and lipid regulation in patients with type 2 diabetes: a randomized controlled trial in Thailand  
Tawanwongsri W, Mordmuang A, Phenwan T, Siri-Archawawat D · 2025
- 14 A 56-Day Randomized, Double-Blinded, and Placebo-Controlled Clinical Assessment of Scalp Health and Hair Growth Parameters with a Centella asiatica Extracellular Vesicle and Growth Factor-Based Essence  
Chang T, Wu C, Huang H, Lu J, Chuang C, Kao P et al. · 2025
- 15 The Effects of a Nursing Program Applying Zinc Oxide Mixed with Petroleum Jelly and Centella Asiatica Mixed with Aloe Vera on Skin Indicators Among Older Patients in Semi-Intensive Care Units: A Pilot Study  
Chaisomsee S, Banharak S, Sommana C, Tuntiyasawasdikul S, Sim-Im S, Ransinyo K et al. · 2025
- 16 The effect of Centella Asiatica cream on scar development in patients who underwent open carpal tunnel release surgery  
Balevi M, Balevi A · 2023
- 17 Therapeutic Potential of Centella asiatica and Its Triterpenes: A Review  
Sun B, Wu L, Wu Y, Zhang C, Qin L, Hayashi M et al. · 2020
- 18 A Systematic Review of the Effect of Centella asiatica on Wound Healing  
Arribas-López E, Zand N, Ojo O, Snowden MJ, Kochhar T · 2022
- 19 Pharmacological Effects of Centella asiatica on Skin Diseases: Evidence and Possible Mechanisms  
Park KS · 2021
- 20 Integration of mass spectral fingerprinting analysis with precursor ion (MS1) quantification for the characterisation of botanical extracts: application to extracts of Centella asiatica (L.) Urban  
Alcazar Magana A, Wright K, Vaswani A, Caruso M, Reed RL, Bailey CF et al. · 2020
- 21 Topical Application of Centella asiatica in Wound Healing: Recent Insights into Mechanisms and Clinical Efficacy  
Witkowska K, Paczkowska-Walendowska M, Garbiec E, Cielecka-Piontek J · 2024
- 22 Safety and Pharmacokinetics of Standardized Extract of Centella asiatica (ECa 233) Capsules in Healthy Thai Volunteers: A Phase 1 Clinical Study  
Songvut P, Chariyavilaskul P, Tantisira MH, Khemawoot P · 2019
- 23 Chitosan-Based Hydrogels for Controlled Delivery of Asiaticoside-Rich Centella asiatica Extracts with Wound Healing Potential  
Witkowska K, Paczkowska-Walendowska M, Plech T, Szymanowska D, Michniak-Kohn B, Cielecka-Piontek J · 2023
- 24 The characteristics of CA-SLNs developed in a lipid-based nanocarrier showed monodispersed particles with an average par...  
· 2022
- 25 C. asiatica and araliadiol suppressed cell death and reactive oxygen species production....  
· 2022
- 26 Indeed, these pharmacological effects of Madecassoside were completely abolished by pretreatment of an intracellular Ca<...  
· 2026
- 27 Cellular responses to araliadiol were assessed in HaCaT and HEK293T cells by measuring reactive oxygen species (ROS) lev...  
· 2026
- 28 Chronic hypoxia induces neuroinflammation by activating microglia, the resident immune cells in the brain, along with an...  
· 2021
- 29 Triterpene pretreatment attenuated the UVB-induced generation of reactive oxygen species (ROS) and malondialdehyde (MDA)...  
· 2024
- 30 Ex vivo skin penetration studies using human cadaver skin confirmed that bicelles achieved deeper and more uniform skin ...  
· 2026
- 31 CAW treatment increased Nrf2 in hippocampus and other NRF2 targets (heme oxygenase-1, NAD(P)H quinone dehydrogena...  
· 2019
- 32 The NanoSECA has a particle size of 127.833 ± 8.280 nm, zeta potential (ZP) of -24.9 ± 0.011 mV, polydispersity index (P...  
· 2022
- 33 Co-administration of the TLR4 inhibitor TAK-242 further enhanced Asiaticoside's protective effects....  
· 2025
- 34 Ulcer closure was the most critical clinical outcome observed. Conclusions In venous ulcerations, Centellicum...  
· 2025
- 35 Asiaticoside also demonstrates synergistic abilities with other biomaterials, creating the possibility of more effective...  
· 2025
- 36 One study reported 10 adverse events for C. asiatica and 35 for tretinoin....  
· 2020
- 37 There was no significant difference in the rate of adverse reactions between the groups. Conclusion A panthenol-e...  
· 2025
- 38 A review of pharmacokinetic and pharmacological properties of asiaticoside, a major active constituent of Centella asiatica (L.) Urb  
He Z, Hu Y, Niu Z, Zhong K, Liu T, Yang M et al. · 2023
- 39 Cardiovascular Protective Effects of Centella asiatica and Its Triterpenes: A Review  
Razali NNM, Ng CT, Fong LY · 2019
- 40 Ethnobotany, phytochemistry, pharmacology, and toxicity of Centella asiatica (L.) Urban: A comprehensive review  
Biswas D, Mandal S, Chatterjee Saha S, Tudu CK, Nandy S, Batiha GE et al. · 2021
- 41 Comparative Studies on Different Extraction Methods of Centella asiatica and Extracts Bioactive Compounds Effects on Antimicrobial Activities  
Idris FN, Mohd Nadzir M · 2021
- 42 Ethnobotany, Phytochemistry and Pharmacological Features of Centella asiatica: A Comprehensive Review  
Torbaty FA, Ramezani M, Dehghan R, Amir MS, Moghadam AT, Shakour N et al. · 2021

### International Health Research

Research, put in context. Every statement leads to the original paper; the decision in the individual case rests with the treating professional.  
ih-research.com/en/knowledge/centella-asiatica/ · Last updated 2026-10-15