



## *Epimedium brevicornum* Maxim. None

*Epimedium brevicornum* Maxim. is a genus of flowering plants endemic native to China. Its bioactive component, icariin, is a flavonoid glycoside demonstrating various antioxidant and anti-inflammatory benefits<sup>[1]</sup>. Numerous in vitro cell culture studies showed that icariin has the potential to suppress inflammatory pathways involved in OA (Osteoarthritis)<sup>[2-7]</sup>. In rodent OA models, joint injection of icariin for 32 and 84 days was found to protect the articular cartilage from degeneration<sup>[4][8]</sup>. One randomized, placebo-controlled study reported pain reduction and functionality improvement in knee OA patients  $\geq 40$  years old after a 6-month supplementation of Xianlinggubao (3 g/day), a traditional herbal formula containing 70 wt% *Epimedium* extract (2.1 g/day)<sup>[9]</sup>. The same study also demonstrated that the supplementation is both safe and well tolerated in knee OA patients<sup>[9]</sup>.



## *Dioscorea nipponica* Makino None

*Dioscorea nipponica* Makino is a genus of flowering plants commonly used in traditional Chinese medicine, mainly for treating bone-related conditions, such as OA (Osteoarthritis)<sup>[10]</sup>. *Dioscorea* extract contains two major bioactive compounds, diosgenin and dioscin, both of which are found to have a protective role against systemic inflammation in vitro<sup>[11][12]</sup>. Numerous pre-clinical studies have also demonstrated the anti-inflammatory and analgesic properties of *Dioscorea* extract in rodent models with induced arthritis<sup>[10]</sup>. Furthermore, two human studies indicated that *Dioscorea* extract is an effective treatment for knee OA by orally given decoction and external application.



## *Salvia miltiorrhiza* Bunge. None

*Salvia miltiorrhiza* Bunge. is sustainably cultivated from a special ecosystem in Shandong Province, China. Tanshinones, the main bioactive components isolated from *S.miltiorrhiza* extract, can significantly inhibit expression of pro-inflammatory cytokines in vitro<sup>[13]</sup>. In rabbit models of OA, supplementation of *S. miltiorrhiza* extract attenuated cartilage injury by lowering oxidative stress<sup>[14]</sup> and reducing chondrocyte apoptosis via regulation of various signaling pathways<sup>[15][16]</sup>.

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