

Brief Communication: French Maritime Pine Bark Extract (*Pinus Pinaster*) and Its Ophthalmic Use

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French Maritime Pine Bark Extract (*Pinus Pinaster*) and Its Ophthalmic Use

Bark extract of *Pinus pinaster* has a long history of medicinal use and is available commercially as herbal dietary supplement with proprietary name pycnogenol. It is used as a food supplement to overcome many degenerative conditions and has been ascribed a very diverse clinical pharmacology [1]. Although there are many potential

uses for Pycnogenol, the well-studied use is for improving vascular health as a result of improved endothelial function and venous insufficiency [2,3]. It is known to demonstrate symptomatic improvement of blood circulation, blood pressure and platelet function normalization, and venous insufficiency [2,3].

Its diverse uses make pycnogenol a promising therapy for much ocular pathology (Figure 1).

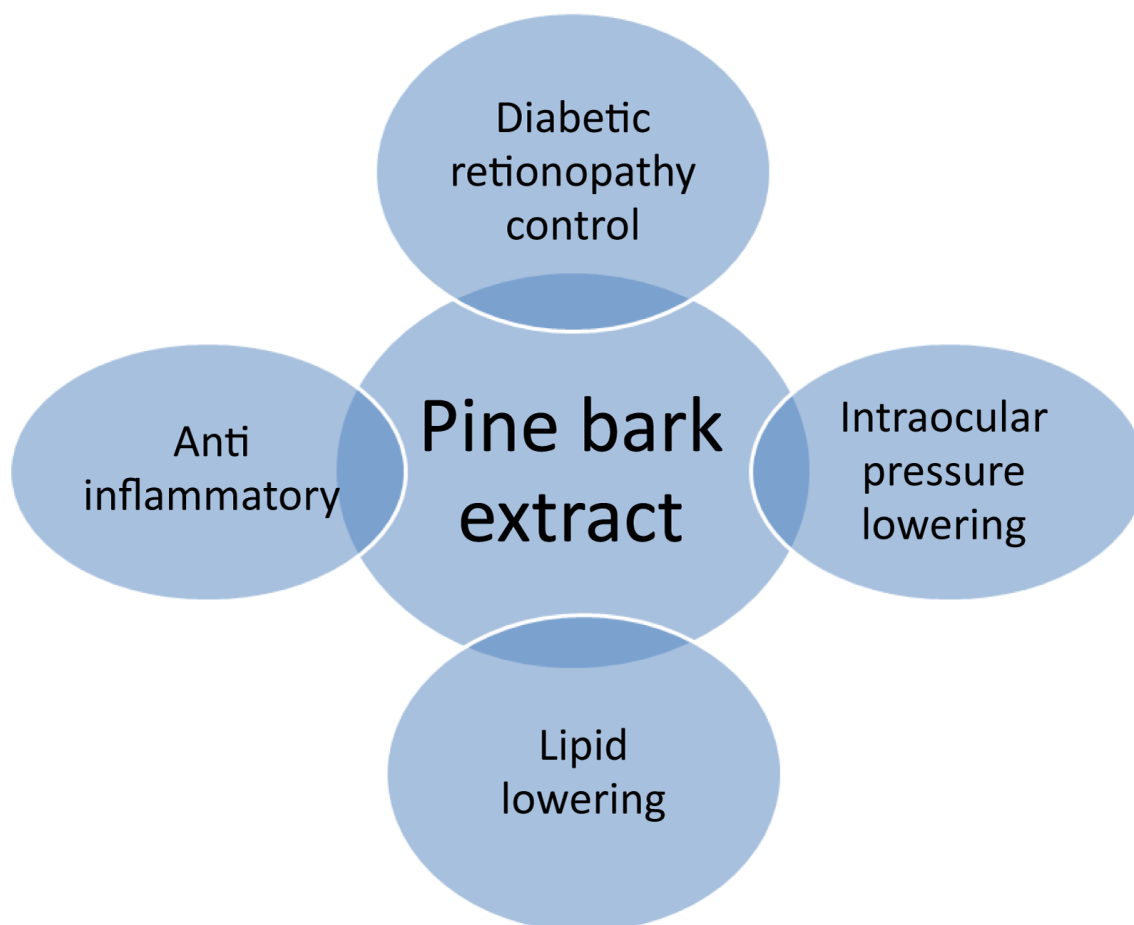


Figure 1: Potential uses of pycnogenol.

Mechanism of Action

Its major actions include (I) antioxidant as radical scavenger, (II) anti-inflammatory effect and (III) action through stimulation of eNOS synthesis.

Studies prove that pycnogenol stimulates nitric oxide to facilitate vasodilatation, which in turn prevents ischemic conditions that trigger angiogenesis hence its use in diabetic retinopathy [4].

It possesses antioxidant activity and acts in synergy with Lutein for prevention of lipid oxidation in the eyes [5,6]. Anti-inflammatory activity for Pycnogenol has also been advocated [7].

Moreover, pycnogenol inhibits alpha-glucosidase, which was shown to lower blood glucose in diabetes [8].

Dosage

For Retinopathy: 20-160 mg/day is advised depending on the severity of disease and given for duration of about 2-3 months. For lowering blood glucose in patients with diabetes the manufacturer recommends taking 50 mg once or twice daily. Due to lack of published data, Pycnogenol should not be taken during the first 3 months of pregnancy.

Pycnogenol in Diabetes

Vision-saving effects of pycnogenol for patients with preproliferative diabetic retinopathy, has been proven in a case series Schönlaue and Rohdewald [9].

A multicenter study in Germany with 1,169 diabetic retinopathy patients showed that daily intake of 20–160 mg Pycnogenol, effectively halted progression of vision loss over a 6 months investigational period. Another study found that Pycnogenol reduced risk of bleeding and improved visual acuity in diabetic patients [10].

Forty-six diabetic patients were recruited for a study with a moderate degree of diabetic macular edema. The patients were randomly assigned to either the Pycnogenol treatment group or the placebo control group. The improvement of retinal thickness as well as edema score was found to be more prominent in those patients with more prominent macular edema. Treatment with Pycnogenol significantly improved retinal blood flow, both systolic and diastolic components, expressed as flow velocity at the central retinal artery [11].

Pycnogenol and Glaucoma

Patented extracts from European blueberries pine bark or Pycnogenol comprise a nutritional supplement by the name of Mirtogenol. It is actually a combination of two phenolic extracts from bilberry (Mirtoselect) and French maritime pine bark (Pycnogenol). Mirtogenol (pine extract with Mirtoselect) was found to be a preventive agent of glaucoma by lowering the IOP and improving the ocular blood flow. Mirtoselect was shown to counteract hyperpermeability of ciliary capillaries [12], while pycnogenol improves endothelial function. Hence dietary supplementation with Mirtogenol has previously been demonstrated to improve intraocular pressure (IOP) because of these combined effects [13]. The effect on IOP was attributed to significant ocular blood flow improvement.

In a study of twenty subjects by Steigerwalt et al [13], subjects were given Mirtogenol leaving 18 untreated as control. The mean IOP

decreased from a baseline of 25.2 mmHg to 22.2 mmHg and 22.0 mmHg after two and three months of treatment respectively. After three months with Mirtogenol, IOP was significantly lowered ($P < 0.05$) in comparison to control. No further change was observed after six months.

Side Effects

Minor side effects include gastrointestinal discomfort, dizziness, headache and nausea. At the dosage of 20–100 mg per day for a long period extended for months, and 100–300 mg for shorter periods is considered nontoxic [14]. While the drug increased retinal flow, no side-effects were observed amongst the 46 patients in the largest study on the subject [11].

It is our unpublished experience that pycnogenol given to patients with early diabetic retinopathy improves visual potential. Also in end stage disease especially ischemic retinopathies, it improves retinal circulation in the long term. However larger studies and more importantly comparative trials to our current protocols for diabetic patients are required to prove the same.

References

1. Rohdewald PJ (2005) Pycnogenol®, French Maritime Pine Bark Extract. In: Dekker, M., ed. Encyclopedia of Dietary Supplement. Informa Healthcare: New York, 545–553.
2. Cesarone MR, Belcaro G, Rohdewald P, Pellegrini L, Ledda A, et al. (2008) Rapid relief of signs/symptoms in chronic venous microangiopathy with pycnogenol: a prospective, controlled study. *Angiology* 59: 385.
3. Iravani S, Zolfaghari B (2011) Pharmaceutical and nutraceutical effects of *Pinus pinaster* bark extract. *Res Pharm Sci* 6: 1-11.
4. Nishioka K, Hidaka T, Nakamura S, Umehara T, Jitsuiki D, et al. (2007) Pycnogenol, French maritime pine bark extract, augments endothelium-dependent vasodilation in humans. *Hypertens Res* 30: 775-780.
5. Chida M, Suzuki K, Nakanishi-Ueda T, Ueda T, Yasuhara H, et al. (1999) In vitro testing of antioxidants and biochemical end-points in bovine retinal tissue. *Ophthalmic Res* 31: 407-415.
6. Nakanishi-Ueda, T, Kamegawa M, Ishigaki S, et al. (2006) Inhibitory effect of lutein and Pycnogenol on lipid peroxidation in porcine retinal homogenate. *J Clin Biochem Nutr* 38:204–210.
7. Grimm T, Chovanová Z, Muchová J, Sumegová K, Liptáková A, et al. (2006) Inhibition of NF-kappaB activation and MMP-9 secretion by plasma of human volunteers after ingestion of maritime pine bark extract (Pycnogenol). *J Inflamm (Lond)* 3: 1.
8. Grimm T, Schäfer A, Högger P (2004) Antioxidant activity and inhibition of matrix metalloproteinases by metabolites of maritime pine bark extract (pycnogenol). *Free Radic Biol Med* 36: 811-822.
9. Schönlaue F, Rohdewald P (2001) Pycnogenol for diabetic retinopathy. A review. *Int Ophthalmol* 24: 161-171.
10. Spadea L, Balestrazzi E (2001) Treatment of vascular retinopathies with Pycnogenol. *Phytother Res* 15: 219-223.
11. Steigerwalt R, Belcaro G, Cesarone MR, Di Renzo A, Grossi MG, et al. (2009) Pycnogenol improves microcirculation, retinal edema, and visual acuity in early diabetic retinopathy. *J Ocul Pharmacol Ther* 25: 537-540.
12. Virno M, Pecori Giraldo J, Auriemma L (1986) Antocianosidi di mirtillo e permeabilità dei vasi del corpo ciliare. *Boll Ocul* 65:789–795.
13. Steigerwalt RD, Gianni B, Paolo M, Bombardelli E, Burki C, et al. (2008) Effects of Mirtogenol on ocular blood flow and intraocular hypertension in asymptomatic subjects. *Mol Vis* 14: 1288-1292.
14. Maimoona A, Naeem I, Saddiqe Z, Jameel K (2011) A review on biological, nutraceutical and clinical aspects of French maritime pine bark extract. *J Ethnopharmacol* 133: 261-277.