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nature,
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by science.

DeerVelvet

Technical manual



**New Zealand
Deer Products**

19 AGEING

19.1 Health Benefits

Although the ageing process is inevitable, it is human nature to seek ways of deferring and ameliorating the process. Velvet antler has been used as a tonic for aged people and as an anti-ageing preparation in Traditional Chinese Medicine, and this might well be linked to its supposed support for:

- ❖ joint mobility,
- ❖ blood,
- ❖ brain function,
- ❖ and general tonic properties.

As might be expected, some Western consumers who subscribe to complementary medicinal principles are showing a keen interest in using velvet as an anti-ageing dietary supplement.

19.2 Suggested Physiological Rationale

Monoamines are neurotransmitters in the central nervous system and they include serotonin, adrenaline, noradrenaline, dopamine, tyramine and tryptamine. The ageing process is associated with the effect of monoamine oxidase in degrading these neurotransmitters. Monoamine oxidase inhibitors by helping prevent the oxidation of neurotransmitting monoamines and so help prevent age-related degenerative change in the brain. Monoamine oxidase inhibitors are used in Western medicine as antidepressants and antihypertensives. From animal studies, it appears that at least in some circumstances deer velvet may act as a monoamine oxidase inhibitor.

Other oxidations, including those that involve free radicals like lipid peroxidation, are also implicated in the ageing process. Suppression of these oxidation processes provides another potential mechanism for velvet to exhibit an anti-ageing effect.

19.3 Research Support

Wang *et al.* (1988a; 1988b; 1988c; 1988d; 1990a; 1990b; 1996) and also Hattori *et al.* (1989) showed that velvet contains components that inhibit monoamine oxidase B (MAO-B). Specifically, these were hypoxanthine, phosphatidyl ethanolamine, sphingophospholipid, phosphatidyl choline, lysophosphatidyl choline, phosphatidyl inositol and uridine. They used an experimental system in which they made a comparison between the effects of velvet antler extract on a strain of senescence-advanced mice and the effects on a strain of normal mice. The velvet extracts significantly altered the metabolism of the senescence-advanced mice, but not the control (normal) mice. In the senescence-advanced mice, the velvet extract decreased monoamine oxidase activity in liver and brain. It also increased plasma testosterone, decreased the content of malondialdehyde in the liver and brain, increased liver superoxide dismutase activity and increased liver protein content. These changes served to reverse some of the physiological changes associated with senescence in this experimental model. Other research (Chen *et al.* 1992; Wang *et al.* 2003a) has demonstrated inhibition of MAO-B in aged mice, and a patented

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velvet formulation in β -cyclodextrin reportedly has greater activity than standard velvet extract (Hsu *et al.* 2003). Recently, supercritical fluid extraction (SFE) has been used to extract MAO-B inhibitors from velvet (Zhou *et al.* 2009c).

A Korean preparation containing dried velvet has been shown *in vitro* to exhibit free radical scavenging activity (Park *et al.* 2005). Similarly, water velvet extract has been shown *in vitro* to reduce lipid peroxidation (malondialdehyde production) and superoxide anion radical production (Chen *et al.* 2003), and to protect myocardial cells against free radical-induced toxicity of doxorubicin (Huang *et al.* 1990).

Kim *et al.* (2004a) conducted an experiment investigating the ability of velvet to reduce the oxidative stress to patients with diabetes. This involved measuring cellular DNA damage, expressed as tail length and tail moment (tail length x percent tail DNA), using single cell gel electrophoresis (COMET assay). Ten patients (4 men, 6 women) participated in the study and consumed two pouches of a commercial deer antler drink every day for 20 days. Blood was collected on the morning before and after the intervention for lymphocyte isolation and blood glucose analysis. Both systolic and diastolic blood pressure showed a tendency to decrease but these changes did not reach statistical significance. Blood glucose level was not affected by the supplementation. After the intervention, the level cellular DNA damage was reduced by over 50%. Although a beneficial effect on lowering blood glucose levels in the patients was not obtained, the results of the short term experiment suggested that deer antler may initially act to reduce endogenous DNA damage. If the same activity is evident in healthy patients, this might provide a mechanism by which velvet is able to exert an anti-ageing effect.