

## A natural way to cardiovascular health

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The article by Dauchet *et al.* (Fruits, vegetables and coronary heart disease. *Nat. Rev. Cardiol.* 6, 599–608; 2009),<sup>1</sup> which reviews the available evidence for the cardioprotective potential of fruits and vegetables, highlights the importance of healthy foods and a balanced diet. This topic interests many researchers around the world who have spent time and effort demonstrating the efficacy of fruits and vegetables in the prevention of cardiovascular diseases and many other chronic conditions.

Fruits and vegetables have been consumed all over the world for centuries, both as food and as a cure for diseases.<sup>2</sup> They generally form part of an individual's normal diet, and are also prescribed by

healers practicing traditional medicine. The Mediterranean diet, which mainly constitutes fresh fruits and vegetables, has been shown to be cardioprotective;<sup>3</sup> although, as pointed out by Dauchet and colleagues,<sup>1</sup> there are other healthy components of this diet and so the benefits cannot be attributed to fruits and vegetables alone.

The consumption of fruits and vegetables for preventing cardiovascular diseases is advocated in a number of traditional systems of medicine; one example is the Canadian Aboriginal system (Table 1).<sup>4–6</sup> To get the best results from natural health products (NHPs), it is important that they are used correctly, including selecting the right plant, in the

right season, and preparing it in the desired form (such as an infusion) either alone or in combination with other NHPs. The action of NHPs depends upon the balance between multiple compounds, which often have conflicting mechanisms, to give a final therapeutic effect.

In order to incorporate the use of fruits and vegetables as complementary therapies into mainstream medicine, more high-quality basic and clinical research is needed. We have reported the cardioprotective activities of various traditionally-used fruits and vegetables such as betel nut,<sup>7,8</sup> ginger,<sup>9,10</sup> carom/ajowan,<sup>11</sup> radish,<sup>12</sup> and peony.<sup>13</sup> In addition to evaluating these plants pharmacologically, chemically, and toxicologically (Table 2), we have also shown that most of these and other NHPs are more active on hyperactive, rather than resting, tissue preparations;<sup>9,10,12,13</sup> this finding is also mentioned by Dauchet *et al.*<sup>1</sup>

**Table 1** | Cardioprotective fruits and vegetables used in Canadian Aboriginal medicine<sup>4–6</sup>

Scientific name	Common name	Family (plant type)	Traditional use (preparation)	Province (tribe)
<i>Populus deltoides</i>	Eastern cottonwood	Salicaceae (tree)	Heart conditions (buds stewed in bear fat or made into a syrupy mix)	QC, ON (Ojibwe, Chippewa)
<i>Quercus rubra</i>	Northern red oak	Fagaceae (tree)	Heart conditions (powdered inner bark)	NS, NB, QC, ON (Chippewa)
<i>Populus tremuloides</i>	Quaking aspen	Salicaceae (tree)	Heart conditions (infusion made from bark)	Western and Northern Canada (Chippewa)
<i>Populus balsamifera</i>	Balsam poplar	Salicaceae (tree)	Heart conditions (infusion made from leaves; resin from buds)	All over Canada (Ojibwe)
<i>Polygala senega</i>	Seneca snakeroot	Polygalaceae	Heart conditions (ground root)	Southern ON (Seneca)
<i>Liriodendron tulipifera</i>	Tulip tree	Magnoliaceae (tree)	Heart stimulant (inner bark of root and trunk)	Southern ON
<i>Asarum canadense</i>	Canadian wild ginger	Aristolochiaceae (herb)	Angina (dried, ground root)	NB, QC, ON, MB (Meskwaki, Ojibwe)
<i>Kalmia polifolia</i>	Bog laurel	Ericaceae (shrub)	To induce hypotension (extract of leaves)	Southern Canada
<i>Veratrum viride</i>	False hellebore	Liliaceae (herb)	To induce bradycardia and reduce blood pressure (infusion made from roots)	QC, NB
<i>Dalea purpurea</i>	Purple prairie clover	Fabaceae (subshrub/herb)	Heart conditions (leaves eaten as vegetable, or infusion made from roots or leaves)	Southern AB, SK, MB, ON
<i>Juniperus communis</i>	Common juniper	Cupressaceae (tree/shrub)	Heart conditions (infusion made from twigs and berries)	Northern Canada (Gitksan, Blackfoot)
<i>Prunus pensylvanica</i>	Pin cherry	Rosaceae (tree/shrub)	Prevention of high blood pressure (infusion made from bark)	NS, NL (Micmac)
<i>Gaultheria procumbens</i>	Eastern teaberry	Ericaceae (subshrub/shrub)	Heart attack prevention and recuperation, regulates blood circulation, prevents blood clots (infusion made from whole plant)	NS, NL (Micmac)
<i>Alnus spp.</i>	Alder (tupsi)	Betulaceae (tree)	Treatment of high blood pressure (infusion made from bark)	NS, NL (Micmac)

Abbreviations: AB, Alberta; MB, Manitoba; NB, New Brunswick; NL, Newfoundland and Labrador; NS, Nova Scotia; ON, Ontario; QC, Quebec; SK, Saskatchewan.

**Table 2** | Cardioprotective NHPs evaluated pharmacologically, chemically and toxicologically\*\*†

Scientific name	Common name	Traditional use	Activity reported	Active compounds	Toxicology <sup>§</sup>
<i>Areca catechu</i>	Areca palm (produces betel nuts)	Hypertension, palpitations/tachycardia	Hypotensive, vasodilator, cardiosuppressant, antiaggregatory	Alkaloids (arecoline), flavonoids (catechin)	Safe up to 2.5g/kg
<i>Zingiber officinale</i>	Ginger	Hypertension, cardiopathies, palpitations, edema	Hypotensive, vasodilator, cardiosuppressant	Phenols (6-, 8- and 10-gingerol, 6-shogaol)	Safe up to 5g/kg
<i>Carum copticum</i>	Carom, ajowan	Hypertension	Hypotensive	Flavonoids, phenols	NT
<i>Raphanus sativus</i>	Radish	Hypertension	Hypotensive, vasodilator, cardiosuppressant	Saponins, alkaloids	Safe up to 10g/kg
<i>Paeonia emodi</i>	Himalayan peony	Hypertension, palpitations, heart failure, atherosclerosis	Cardiosuppressant, vasodilator, antiaggregatory	NT	NT

\*For complete experimental details, see References 7–13. †The pharmacological and toxicological tests were performed on laboratory animals. § Acute toxicity tests examined behavioral changes and mortality. Abbreviation: NHPs, natural health products; NT, not tested.

Most importantly, more randomized controlled trials investigating the effects of NHPs are needed. Conducting these studies is costly, and securing the required funds for NHP trials is difficult, although alternative strategies are available.<sup>14</sup> Active participation from the medical community will be helpful. Throughout the history of medicine, physician–scientists have been instrumental in the area of ethnopharmacology and clinical use of NHPs.<sup>15</sup> There is a need for physicians to be trained, right from their initial years at medical school, in the various forms of complementary therapy. This would equip physicians with an additional therapeutic tool and will help prevent problems like inadvertent adverse drug–herb interactions. It will also give

patients the confidence to let a trained physician know of their alternative therapy use. Fruits and vegetables have been used medicinally through the ages, but the road toward gathering the evidence needed for their definitive use is still long.

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doi:10.1038/nrcardio.2009.131-c1

#### Competing interests

The authors declare no competing interests.

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