

Sunday Herald

# The Nova Scotian

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## Nature's pharmacy

Old-growth hemlock forests  
contain medical miracles

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## COVER STORY

# Hemlocks: nature's pharmacy

Clearcuts of old-growth forest imperil medical research as well as ecological resource

By DONNA CROSSLAND

**F**OOD SUPPLIES were sometimes meagre when the first Europeans settled along Nova Scotia bays and rivers. Inland, a boundless nearly unbroken forest canopy greeted them, much of it comprised of old growth eastern hemlock.

Settlers generally regarded the enormous trees of the Acadian forest as an impediment to homesteading and growing food. They hurriedly cleared the trees to cultivate potatoes, other vegetables, and livestock

feed. Hemlock trees were among the least valued of Acadian forest species since the soils beneath hemlock stands generally produced poor crops, and even its wood properties had limited application.

## NOVA SCOTIA



## NATURALLY

Crops of the early settlers sometimes failed, causing them to go without vegetables for many months. Little did they know of nature's bounty of food growing near them in the shadows of dark forests, peeking out of the duff under old hemlocks. A large, nutritious mushroom, the 'matsutake' (pronounced maht-soo-tah-keh) proliferates when fall weather conditions are just right. The matsutake (*Tricholoma magnivelare*) also known as the 'pine mushroom' (though our species is more strongly associated with hemlock than pine), grows a thick, broad cap (pileus), up to 25



A 300-year old hemlock tree grows around a huge boulder in Digby County. Here, both a glimpse into the province's ecological past and medical future.

## COVERSTORY

# Hemlock

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cm across, with a short, stalky 'stem' (stipe), abruptly tapering near its base. The dense, white flesh is highly prized for its fragrant, unique aroma. This mushroom is one of nature's most delectable treats.

The surprisingly firm flesh produces a hearty, meaty texture when cooked. It is high in protein and rich in vitamins B1, B2, and D, and is believed to have many beneficial health properties. Fresh matsutake can be barbecued with a little salt, but is extraordinary simply sautéed in butter; an all-purpose mushroom that can be used in a variety of recipes that call for mushrooms.

While the matsutake mushroom is a chef's choice in Japan and parts of continental Europe, most Nova Scotians have never even tasted it. Instead, thousands of pounds are flown from Canada to Japan every year. The Japanese matsutake is actually another closely related species, (*T. matsutake*), and has been consumed through the ages.

Today supplies are dwindling, mainly due to loss of suitable habitat. Thus they readily accept our very similar North American species, though it fetches lower prices than the domestic variety.

The best quality North American mushrooms can sell for \$100-\$600 per pound. The Japanese covet the matsutake as a ceremonial mushroom; apparently it's often given as gifts to mark special occasions and also to celebrate autumn.

Nova Scotia prices vary, depending on the domestic supply in Japan and other countries, as well as matsutake harvests from B.C. In 2012, mushroom pickers in Queens County received \$24 per pound for top grade, or number 1 matsutakes.

Buyers grade the quality of each mushroom: Number 1 matsutakes are young mushrooms with tightly closed caps, generally picked while they are still partly concealed under the forest duff or moss. A number 2 mushroom has an open cap, allowing the gills to release minute reproductive spores, while number 3 mushrooms may be overmature or marred. Some pickers have arrived too late to a mushroom patch and experienced significant revenue losses to hungry wildlife like white-tailed deer and slugs, which readily munch on matsutakes and can render top quality mushrooms to 'partly consumed' mushrooms, graded number 3.

Mushroom pickers say an average acre of hemlock forest in southwest Nova Scotia can produce 200 pounds

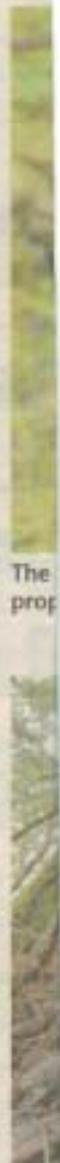


Old-growth hemlock stands in Nova Scotia do not naturally

of top quality matsutakes (the lower grades are often not harvested). That's a total of \$4,800 per acre.

While we traditionally equate profits from the forest as being achieved through the relatively laborious task of felling trees, the mushroom picker ambles in search of mushrooms under the shade of cathedral hemlocks, rarely breaking a sweat. They fill baskets or backpacks with matsutakes, often from the same patch they have carefully harvested over 10-20 years. One picker in Queens County last year, during a two-week period, made \$2,700, his worksite a 150-300 year-old conifer woods.

In Maine, a picker described two people who harvested a total of 125 lbs in a little over three hours. According to last year's price, that's a value of \$3,000; not bad for a morning walk. Perhaps the best part of this story is that



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regenerate once they're clear cut and take hundreds of years to develop to this stage.

(ALAIN BELLIVEAU)

these same stands of hemlock can go on producing similar profits year after year if left intact.

Some greedy individuals are beginning to damage the matsutakes by raking the forest duff and moss where they grow, harming the thread-like mycelia that interconnect matsutakes to one another and to the hemlocks. Hopefully this activity will be curtailed. Most pickers have a strong sense of stewardship, knowing that if they treat the forest floor with care, they can harvest the same location for decades.

A cautionary note to those thinking of harvesting wild mushrooms: The matsutakè can be confused with its deadly poisonous cousin, the amanita.

**A potentially** more valuable fungus than the matsutake, with potent, cancer-fighting medicinal qualities, grows

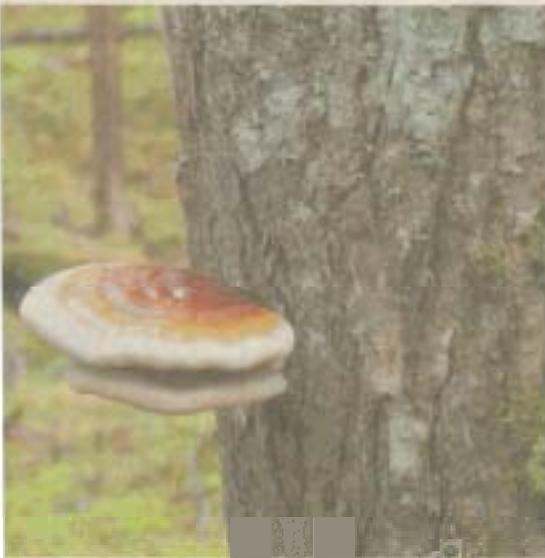
on dead and dying hemlocks. A 'bracket' fungus, the hemlock reishi (*Ganoderma tsugae*) decorates hemlock trunks with shelf-like growths. Its upper surface matures to a dark reddish color sporting a shiny, lacquered appearance; hence another common name is hemlock varnish mushroom. Tiny brackets begin growing in May-June and mature through the summer. The tender edges of young hemlock reishi can be thinly sliced and sautéed in butter. But the true wonder of this mushroom is in its capacity to heal certain cancers.

Cancer research using hemlock reishi confirms encouraging results, particularly in breast and lung cancer, and also in the prevention of metastatic tumours. There has even been remission in some people with the most common type of liver cancer (hepatocellular carcinoma).

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COVERSTORY



Boletus mushroom contains anti-oxidant properties useful in the treatment of several cancers. (MARK F. ELDERKIN)



Matsutake mushrooms are a delicacy in Japan and can be \$24 per pound to a picker. But be careful: a poisonous mushroom called the amanita looks like the matsutake. (Mersey Tobetic Institute)

...ems to possess the strongest antioxidant activity of the species tested. Reishi fungi have been used in traditional Chinese medicine for more than 2,000 years to treat autoimmune conditions, asthma and inflammation. Reishi has enhanced immune response in advanced cancer patients, the effectiveness of radiotherapy, and alleviated chemotherapy-induced nausea. Further research is needed to explore the medicinal properties of hemlock reishi. For now, it appears that we are close to exploring all of the healing powers among the hemlocks.

...potential market economy from eastern hemlock. Further research, and sooner rather than later. The forest continues to be indiscriminately clear cut along the coast of Nova Scotia's forest at an alarming and rapid pace. Once these forests are clear cut or dis-

turbed to a large degree, the matsutake does not return, nor does the hemlock, generally requiring cool, shaded protection to re-establish. Partial harvests (e.g. small patch cuts, or single-tree selection) are the way most of the Acadian forest must be cut if we are to preserve its biodiversity. It's already too late to save most of the forest of eastern Nova Scotia, but great remnant stands of forest, some with hemlock, remain in the southwest. Will we lose these systems, too, before they are understood?

I hope this article does not spark a stampede to the last remnant hemlock stands by people who do not appreciate these forests for anything other than money.

**It is best** to appreciate hemlock forests for the food and shelter they offer wildlife. On a cold winter's day, the shelter afforded under a canopy of hemlock excludes wind and snow, the same virtues sought by the moose, deer, and other species.

Those fortunate to walk among magnificent hemlock cathedrals speak of feeling spiritually refreshed and renewed, an experience that extends beyond monetary returns.

Mushrooms are only one small example of why we should keep these forests. I've focused on the potential market economies from such great forests only to inspire readers as well as politicians, provincial and industrial foresters and other decision-makers to think beyond short-sighted issues of wood flow for greedy pulp mills and large modern sawmills, to preserving the last remnant stands of a once-great forest dominated by hemlock.

It's time to think beyond the wood, to the little-explored world of fungi, lichens and other biota, nature's pharmacy, that grow obscure and protected by the trees, often requiring forests of great age or decadence to flourish. Imagine celebrating the autumn with our native fungi, not only the matsutakes, but a bounty of other mushroom species that grow in mature to old-growth forests, particularly in autumn: black trumpets, honey mushrooms, oyster mushrooms, chanterelles, and many more. A bounty of flavours, fine-dining, and potential tourism opportunities await us.

Value our majestic hemlocks, which can out-live us, through many human generations and worldly changes, for their great legacy and their complexities, and all they may give us.

*Nova Scotia Naturally* is a monthly column by Wildland Writers, a roster of Nova Scotia wilderness experts. This group includes Dagna Crossland, David Patriquin, Bob Bancroft, Alain Belliveau, Mark Elderkin, Matt Miller, William Martin and Jamie Simpson.

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