

## Wondrous Pollen and Seeds

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Each February, per my family's tradition, I walk through snow to a birch tree and cut branches to bring home and keep in a vase. In the warmth of the house they will produce young leaves. This is usually around Easter. It looks springy; I'll hang emptied, decorated eggs and ribbons on them. I enjoy the sight of this bouquet while there's still no leaves to be seen in nature.

One year, a branch still had a few of those worm-like Catkins hanging on it. They come in pairs. Intrigued, I took one of them apart. Turns out it was a female catkin, and these minuscule triangles that composed it, were actually SEEDS ! Compared to the size of a grown Birch tree, the seeds are astonishingly small. They are lightweight, with a tiny seed situated between 2 winglets. This structure allows them to be easily carried by wind, promoting long distance distributions.

My sample of catkin had over 800 seeds! Research shows one birch catkin can contain hundreds or thousands, of tiny seeds. A large tree potentially produces millions of seeds each year.

I showed my dissected catkin & a few whole ones to my husband. Astonished, he said he'd grown up at the fringe of this forest, hunted in it for decades, sometimes napping under birch trees, but never knew that they contained myriads of seeds.

Before seeds, came POLLEN. A single male birch catkin can contain **1.9 to 5.5 million** pollen grains depending on tree size and environmental factors. That number blows me away. My 4th grade teacher told our class, to count from 1 to one million, starting by 1, 2, 3, 4, 5, until 999 999 plus 1, a person would count day and night for 3 months straight. I never forgot that & It put numbers into perspective. I grew up outside Munich (Germany), which contained 1 million people. The town seemed endless with all its streets and buildings. Ever since, "*one million*" has physical meaning.

As a young adult, walking through a swampy area, I took cattails home to arrange in a dried flower bouquet. Months later, fluffy puff appeared. All the cattails broke open, quintupled in size and invaded my living room with clouds of whitish fluff. Those seeds were so light; they managed to fly away from the vacuum cleaner. I found them in every nook and cranny of the room. Cleaning them was exhausting. Later I learned that depending on size, cattails contain between 200,000 to 1,500,000 seeds per tail. They are edible and some of your grandmothers, might have used them instead of flour. They'd prepare baked goods and tasty pasta.

The smallest seeds on earth grow in Vanilla pods. If you opened a pod lengthwise to scrape the black moist laminae, you collect over a million tasty seeds. What would apple pies and whipped cream be without vanilla ? Emptied pods contain a heavenly aroma. My grandma placed those in a special can to flavor sugar.

The Vanilla Plant is an Orchid that grows on trees in tropical forests. Madagascar is the world's most prolific producer.

In contrast, the tallest seed on earth is the coco de mer (*Lodoicea maldivica*), It's about double the size of a coconut, followed by the actual Coconut at 6 inches in diameter.

### **New Hampshire and pollen**

I researched pollen because of prevalence of allergies. Don't blame all trees for allergies. Only oak, birch, maple, cedar and hickory are known to produce allergenic pollen.

The grains are lightweight and easily carried by wind and likely to be inhaled. Pollen production is staggered over the season. People who are allergic develop symptoms like nasal congestion, postnasal drip, sneezing, itchy, watery eyes, wheezing or even anaphylaxis.

Pine pollen grains can be 60 to 100 micrometers in diameter. This is large compared to other pollen grains

Plants create abundant pollen to ensure seeds spread across wide areas. Pine pollen is dispersed by the wind, up to 1800 miles. All this to diversify genetic material.

A mature *Pinus radiata* (pine tree) produces between 1.10 and 1.70 pounds of pollen each year. The tree produces male cones at the tips of its branches in the spring.

Each cone is full of pollen. Once wind borne, pollen gets exposed to extreme cold, UV radiation, drought, heat, as well as rain. Archaeologists still detect them in the strata, even after thousands of years!

It was a big surprise to discover pine pollen is used as treatment for a variety of health-related purposes, such as supplementing diets, slowing aging, reducing fatigue, boosting testosterone, treating colds and constipation.

Pine pollen is nutritious; it contains fatty acids, carbohydrates, minerals, such as calcium and magnesium, B vitamins and vitamin E. If you are allergic to pollen, please don't try to eat it.

Pine pollen is low in protein. Bees will ignore it unless nothing else is available. Bees eat pollen from many trees, including fruit trees, maples, and several berries. Oak trees don't provide traditional nectar like other trees and flowers, but honeybees and other pollinators still favor them, because oaks secrete a substance similar to nectar to attract pollinators.

After distribution of pollen, pine cones grow seeds, on average about 150 per cone.

Each scale contains two seeds. A full size tree may produce over a million each year and a Pine tree can live for 100 to 1,000 years. The Great Basin bristle cone pine is the longest-lived pine tree, with some living over 4,800 years. Seeds produced during their lifetime must be astronomic in numbers.

### **Other Curiosities:**

Radish seeds (*Raphanus sativus*) may surprise by starting germination while you hold them for about 10 minutes. Natural moisture of your hand cracks their skin. Show it to kids and surprise them. Radishes are the fastest-growing vegetable.

Legumes like peas, pole beans, Fava beans, and common beans are some of the easiest seeds to grow.

Did you know, that a sunflower head can contain 1,000 to 2,000 seeds ?

The number of seeds in a cucumber can vary from 100 to 420, depending on the type of cucumber. Slicing cucumbers contain more seeds than pickling cucumbers.

A watermelon can contain anywhere from 400 to 6,400 seeds, depending on the size of the fruit.

On average, a strawberry has around 200 seeds. They are technically achenes; seeds are located on the outside of the strawberry.

Each achene is a small, dry fruit containing a single seed. Strawberries are part of the rose family and are the enlarged ends of the plant's stamen.

A blueberry can contain anywhere from zero to about 50 seeds. They are so small and soft, you won't notice them when eating berries.

The lupine genus (*Lupinus*) includes native and non native species. Have you collected seeds and tried them in your garden ? People complain that no lupines emerge. I've scattered them in the thousands with no result. I collected stalks and without much hope scattered seed to unlikely places (on poor sandy soil) around our garage. There's not much sunshine there. 3 years later-16 seedlings produced their first leaves and in a couple years grew into beautiful plants. Surprisingly they bloom abundantly, even ones in the shade (go figure!). How come, that took 3 years to germinate ? Was it the climate or was it arbitrary ? Seeds have their moods sometimes!

Lupines have a lifespan of 6 years. Plants produce about 5 stalks, with around 130 seed pods containing 7 seeds each on average. That makes 4450 seeds per plant, per year.

**Visual vs. Potential:** Some seeds lay dormant for many years, enduring frost, heat, drought and floods. Some mighty trees grow from surprisingly small seeds.

Seeds do not resemble the plant that produced them, and have to break open to germinate. Their first two leaves do not resemble later leaves. Those cotyledons are considered "seed leaves" The outer shell of any seed will invariably rot away.

I will end this expose' with a philosophical phrase from common folklore :

**You can count the seeds in an apple, but you cannot count the apples in a seed.**

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