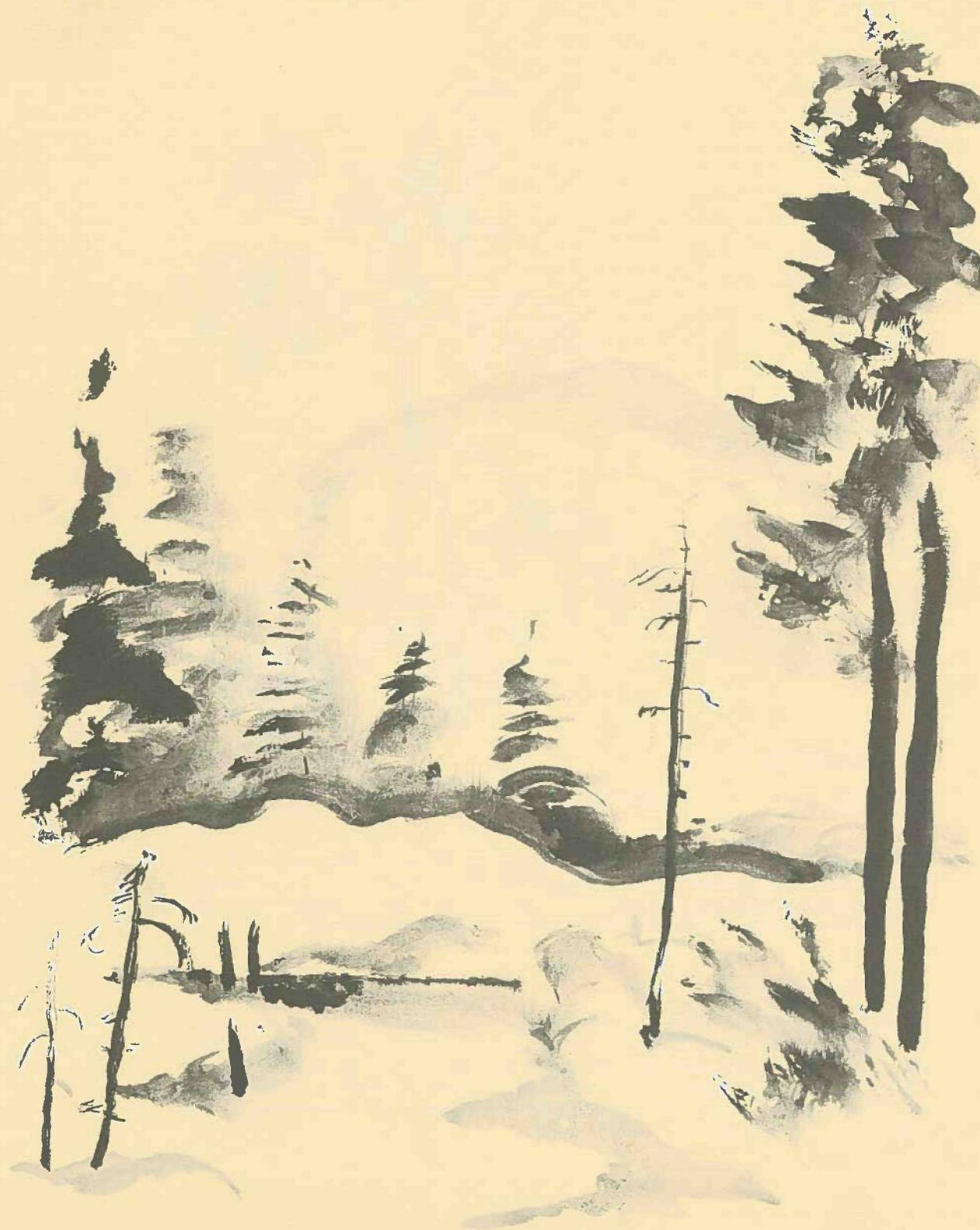


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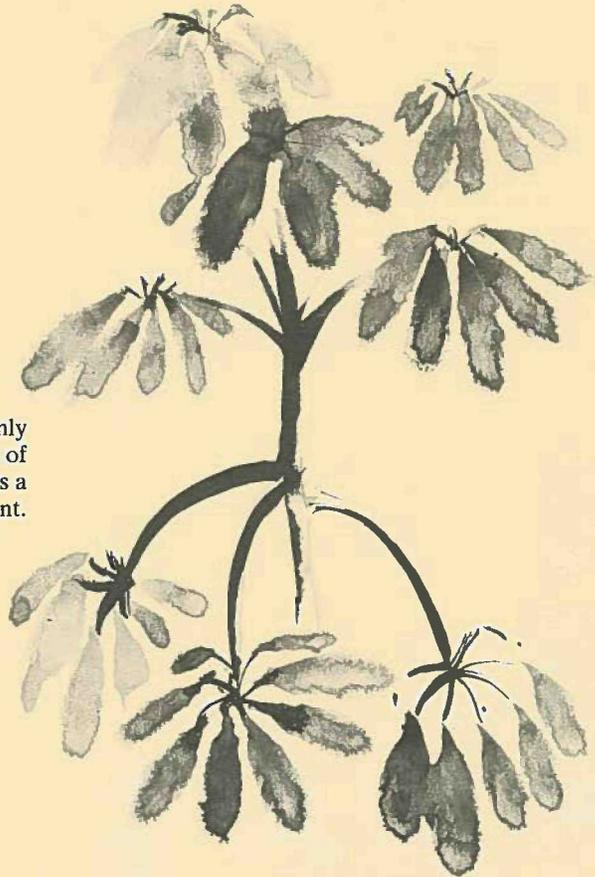
Winter 1975



Cover

A sub-alpine peat bog, a typical habitat of Alpine Larch, *Larix lyallii*.

Schefflera actinophylla. The commonly grown Octopus-tree is a native of Australia and now widely used as a popular house plant.



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A Selection of Tropical Plants from The U.B.C. Botanical Garden

MARGARET COXON



Platycerium vassei. The Stag-horn fern is an interesting exotic that provides excitement to any indoor plant collection. A native of Mozambique, this plant requires a humid atmosphere for good growth.

The greenhouse component of the Botanical Garden contains a collection of varied plant specimens from tropical and sub-tropical areas of the world. Uses of the collection include observation, education and research both for the University and the general public.

In the area of education, students, ranging from pre-school to senior citizens, broaden their knowledge of plant life and other areas of world by observing and working with the collection. Class material is provided for many on and off campus courses in Botany, Plant Science and Horticulture education.

An increasing collection of fern and fern allies is housed for teaching and research purposes. Another new collection of great interest is the Mexican cacti and succulents collected and donated by Mr. and Mrs. Charles Brown of Vancouver.

The tropical areas of the world offer many splendid plants appreciated for their beautiful color, variegation, flowers, fruit and unusual form. One of our prime objectives is to grow such plants for class use and their observation and enjoyment by plant enthusiasts. Specific information concerning some of our most useful plants is the subject of this special introduction to our plant collection.

Growing tropicals or warm temperate plants indoors has long been the hobby of a few enthusiasts, but lately it has become a most popular pastime enjoyed by many people.

The easier and well known plants are used widely as decorative specimens but perhaps a look at some of the less known or more difficult plants would help broaden the appeal of some collections.

Plants for color and variegation

A. Maximum light is required by some of these more colorful plants to insure against fading or reversion to the plain greens.

Codiaeum or Crotons of South East Asia are typical of foliage plants. New leaves progress from green through yellow, orange, red and burgundy and at maturity, they exhibit a combination of many colors. *Acalypha wilkesiana* var. *macafeana*, the Copper-leaf, from the New Hebrides is colored in many tones of orange and red forming a beautiful much branching shrub (Figure 1). Both the *Acalyphas* and the *Crotons* are a challenge for the home grower as they are favoured by mites and drop their lower leaves constantly unless well cared for.

Saxifraga sarmentosa 'Tricolor' is a very slow grower that sends out runners and plantlets in ivory, pink and green making an attractive hanging or terrarium plant.

B. Partial shade and high humidity are necessary to grow the following:

Cissus discolor from South East Asia, a striking purple, green and white tendril climber with a lustrous sheen. It is often used as a hanging plant but tends to do better as planter ground cover.

Calathea zebrina from Brazil is a stunning low grower with leaves in tones of green with undersides of purple. All of the *Calatheas* are a challenge to the home grower (Figure 2).

Begonia rex 'Merry Christmas' makes a welcome break from the regular festive season plant offerings. It is a most durable hybrid with very striking foliage, blood red in centre surrounded by bands of red, silver and fresh



FIGURE 1. *Acalypha wilkesiana* var. *macafeana*, the common Copper-leaf, native to the New Hebrides.

green and a reddish border. This plant and most of the Rex begonias make excellent light garden growers and are very easily propagated by leaf or leaf sections (Figure 3). *Begonia masoniana* from Singapore is another handsome grower to challenge the skilled tropical gardener. A reddish-brown cross is clearly formed on the fresh green and much undulating foliage. This Iron Cross Begonia is more susceptible to mildew than most of the other begonias (Figure 3).

C. The following plants require partial shade and average humidity and are desirable houseplants:

Dieffenbachia picta 'Rudolph Roehrs'. The brightest of all the Dumbcans, with a border and mid rib of green surrounding the blotched and marbled ivory and yellow centres. Quite a delicate appearance for a Dieffenbachia and an excellent accent plant in any collection.

Begonia serratifolia. A gorgeous ground cover from New Guinea has a small but highly lobed, frilled and pleated leaf colored deep red and overlaid in bright pink spots. Another feature of this much branching plant is its abundant blossoms. Excellent for use as a hanging basket or standing plant.

Rhoeo spathacea. Another ground cover, this time from Mexico and the West Indies, is commonly named Moses-in-the-cradle. This name relates to the tiny boat-shaped bracts holding tiny white flowers tucked away at the base of the leaf joints. It is a tough plant with deep green foliage packed in a beautiful rich purple rosette. *Rhoeo spathacea* 'Vittata' is a variegated form striped lengthwise in yellow, red and purple but is inclined to revert if the culture is not correct.

Fatsy lizei 'Variegata' is a tricolor form of the very common *Fatsy* the bigeneric hybrid of *Fatsia japonica* and *Hedera helix* var. *hibernica*. Edged in white and cream the leaf centres are marbled green giving a very cool effect to this easy-care plant.

D. The last two of the colorful plants will tolerate full shade and as such make desirable house plants:

Aspidistra elatior 'Variegata' from China is a lovely form of the old favourite the Cast Iron Plant. It has striped green and white leaves and stands a few decimeters tall making an excellent planter or pot specimen totally unruffled by abuse.

Aglaonema costatum from Perak is a choice low growing spotted evergreen perennial of slow growth habit. The foliage is a glossy dark green spotted white with white centres.

Plants particularly useful for flowers and fruits

Most of our tropical houseplants blossom in their natural habitat to set seed and so reproduce. In the great indoors, however, many factors interfere with this process. Light conditions, seasonal differences, temperature, soil, nutrients and plant age are all factors affecting blossoming and with some plants, it is likely too difficult or undesirable to have them blossom.

If you wish your plants to blossom and set fruit, good light and careful application of fertilizer are the two prime factors.

Coffea arabica from Africa is an economically important and very handsome plant. It grows to 5 m with very lustrous deep green leaves on its many branches. The flowers are very fragrant white stars that may later produce a red cherry containing two beans (seeds) from which coffee is made. A most decorative and interesting plant grown easily from fresh unroasted seed.

Psidium cattleianum the Strawberry Guava from Brazil is a bushy shrub that slowly reaches 3 to 4 m in height. The fruit, the size of a large cherry, is deep red and tartly delicious — often used for making jelly.

Citrus species, as a rule, make interesting house plants but if grown from seed, seldom grow true to the parent. Two exceptions are *Citrus mitis* — Calamondin Orange — a dwarf shrub with tiny fruit that are quite sour but make a good addition to salad dressing, or flavour for drinks. *Citrus limon* 'Ponderosa' — Ponderosa Lemon. This plant produces an amazingly large fruit at a very early stage on a rather rangy habit. The shrub responds very well to pruning.

Ananas comosus, the Pineapple from the tropical Americas is a very interesting and easy plant to grow. It is a terrestrial bromeliad grown by tip cuttings from the top of the fruit and by suckers from the base of the parent. The stem of the plant passes right through the centre of the fruit which usually forms when the plant is two years old. Fruit can be induced through the release of ethylene gas from a sliced apple placed around the base of the plant and the entire plant sealed with a plastic cover for 4-5 days. There is a very beautiful variegated and even a miniature form of the pineapple to grow indoors.

Of all the blossoming plants few families have as many stunning specimens as the Gesneriads (African Violet family). Most of these soft beauties require warmth, good light, high humidity, porous soil and good feeding



FIGURE 2. *Calathea zebrina*, the Zebra Plant, a native plant from the Amazon region of South America.



FIGURE 3. Some begonia cultivars. In the lower left can be seen *Begonia masoniana*, the Iron Cross Begonia, native to South East Asia and on the lower right is *Begonia rex* 'Merry Christmas', a striking begonia worthwhile cultivating in any household.

FIGURE 4. *Hoya bella*, the Minature Wax Plant, a native from India.

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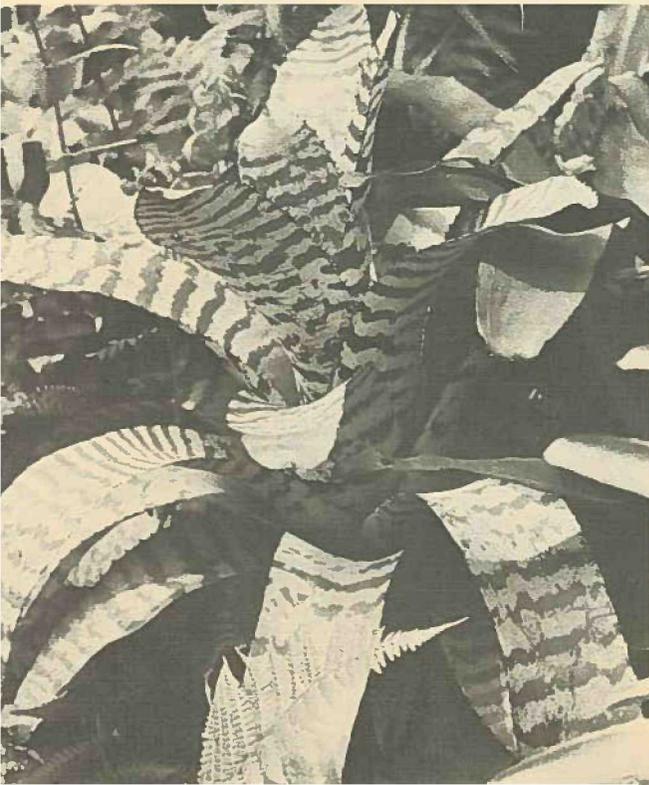


FIGURE 5. *Aechmea chantinii*, the Amazonian Zebra Plant, is a native of the Amazon region of South America, produces the inflorescence on the branched spike with tight red bracts tipped yellow and subtended by red bract leaves.

to produce a lengthy show of blooms. All grow easily from leaves, seed, division, cuttings and at times tubers.

Sinningia pusilla is truly a tiny wonder growing in rosette form to less than 6 cm tall. Tiny dark green leaves hug the ground with pale purple blossoms about 1.5 cm wide and up to 3 cm long. It grows best under glass or in a protected area. *Streptocarpus saxorum*, the False African Violet, is a much branching small plant from Tanzania with an abundance of pale purple blossoms through the bright months. The small, delicate foliage makes for a good pot, terrarium, light garden or hanging plant. Some other *Streptocarpus* have larger leaves and flowers rising on long stems and nod bell-like above the foliage. An interesting and showy group.

Episcias or Flame Violets are glamour plants from the Americas with their beautiful quilted foliage and trumpet blooms. *Episcia dianthiflora* is a cascading plant with plain green foliage set in rosettes and lovely fringed white blossoms.

Columnneas are tropical American plants well suited to hanging baskets because of their predominantly epiphytic nature. *Columnnea microphylla* is a small leafed trailer, blossoming in spring and summer with very exotic red and yellow trumpets. *Aeschynanthus* is a genus of epiphytic trailers from the Americas but are of coarser habit than the Columnneas. *Aeschynanthus marmoratus* has a very beautiful blossom and is a plant with waxy foliage striped yellow-green and maroon. The Zebra Vine and the Black Pagoda are equally beautiful viewed above or below the plant.

Begonias are another group rich in bloom. Many Wax or Fibrous Begonias can be easily cultivated indoors or outdoors but one with a difference is *Begonia semperflorens* var. *albofoliis* 'Maine Variety' commonly known as the Calla Lily Begonia. The new foliage is white-edged in pink and progresses through to green on the older leaves, the latter showing off the small, but rich pink blooms.

Begonia fuchsioides var. *floribunda* is another remarkably different begonia. Its small leaves, upright nature and clusters of hanging blooms make it appear much like a fuschia with a rather oriental appearance.

The Hoyas or Wax Plants are a winning group ideal for a bright window where they can be left undisturbed. To flower, the plants need to be dried and cooled through the winter months, then well watered in spring. This cultural process is well worth it as they possess quite stunning clustered star-like flowers often with a pretty perfume. *Hoya bella* from India is a small grower with compact dark green foliage and white blossoms with purple centres. It is ideal for a hanging basket (Figure 4). *Hoya carnososa* var. *variegata* is certainly common but choice enough in changing foliage and the odd blossom to make it a desirable collection plant.

Many of the Sour-clovers or Wood-sorrels are weeds but a few of them are well worth growing because of their lovely blossoms and unusual leaves.

Oxalis braziliensis from Brazil is a bushy low grower with lovely deep green clover-like leaves and large pink flowers opening only in sunshine during the cooler months. In many countries of the world the stems are munched for a sour treat.

Rivalling the orange blossoms for beautiful perfume are the Pittosporums from China and Japan. *Pittosporum tobira* is a reliable bushy branching plant with deep green foliage and white spring time blooms. *Pittosporum tobira* 'Variegatum' is also a tough plant and the two "Pits" planted together make a splendid show.

Ardisia crispa the Coral Berry from Asia is a low growing tree worthy of any collection. Many are sold for their pretty foliage but are not truly appreciated until richly covered in long lasting bright red berries.

Euphorbia splendens var. *bojeri* from Madagascar is the Crown-of-thorns of biblical fame. A thorny grower with dark green leaves and bright crimson flowers in clusters throughout the year. It thrives on neglect and if over watered the foliage will be gorgeous but the flowers non-existent or rare.

Many collectors feel cheated by the lack of 'holiday flowering plants' or gift plants but growing some of the more durable or choice blossomers usually cures that. The plants that treat us with flowers are a fussy bunch worthy of care and attention and the very best in situations throughout the house.

Plants with interesting form and structure

Some plants have much appeal but are not known especially for their coloration or blossoms. Their FORM or SHAPE is their most stunning attribute and as such they are the main stay of a normal collection. Bromeliads fall easily into this grouping with their fairly typical rosettes and bizarre foliage designs and growth habits. Culture is extremely easy and the epiphytes should be framed, rock grown or wood grown to show them at their best. These natural vases need a constant supply of water in their cups or a regular spraying on the foliage of the spreaders to keep them in good condition.



FIGURE 6. *Cycas revoluta*, or Sago Palm, a native of Southern Japan. This primitive evergreen conifer is well suited to large display areas.

Aechmea chantinii is a stunning striped Amazonian Zebra Plant with an almost perfect rosette to 60 cm tall. It tends to be very top heavy and does well in a pot (Figure 5).

Tillandsias are most definitely strange plants that do very well on bark, cork, moss, wood, or rock as they would grow in their native Americas. Spanish moss is a *Tillandsia* and many of them have that typical grey wispy dead appearance that belies their life.

Cryptanthus is a bromeliad genus that is commonly called Earth Star. Many species grow as epiphytes and are appreciated for their flat star-like appearance, beautiful markings and ease of care.

Few plants can successfully compete for the grace and slender beauty of palms in the development of a decorative tropical effect. Most palms are slow growing and easy to care for but have one major disadvantage—the choice palms are the most expensive of all the house plants.

Rhapis excelsa and *Rhapis humilis*, two Lady Palms from China are beautiful tall spreading clumps with slender cane-like stems and gracious hand and finger shaped foliage. Unfortunately, the lady palms are becoming quite rare, because they are so difficult to propagate (see illustration facing p.60).

Cycads are equally expensive but not yet as rare as the Lady Palms. They are the ancient Sago Palms with very coarse foliage, symmetrically formed and appear as gigantic ferns. Very slowly, they fill a fairly large area as mature plants but are very easy to look after. *Cycas revoluta* from Asia is a broad grower (Figure 6) and *Cycas circinalis* is a tall grower.

Phoenix roebelinii, the Dwarf Date Palm from Asia, is a widely available and easy care palm tolerating dry air and low light. The foliage is deep green in color and arches gracefully with a feathery appearance.

Ferns have a wide appeal and, although not easy, can be a most rewarding hobby group with consistent care. The Foot Ferns make fascinating hanging or standing specimens. *Davallia fejeensis*, the Fijian Rabbit's Foot Fern and *Davallia trichomanioides*, the Carrot Fern both have lovely feathery light green fronds and fuzzy creeping rhizomes. For a gorgeous effect they can be grown on porous rock. *Polypodium aureum* var. *glaucum*, the Hare's Foot Fern and *Polypodium mandianum*, Mandy's Blue Fern, are very large growers with large flared fronds shining blue when young. They spore readily and are considered 'easy' ferns for the home grower. The favourites of the epiphytic ferns are the Staghorns from Australasia and Africa. These handsome ferns have two types of fronds. Long fertile spore bearing 'antlers' and short shield shaped sheaths that adhere to the host support plant, protect the roots and act as a catchment area. The easier Staghorns grow well indoors and if just developing their sheaths are very easy to frame. *Platycerium alcinorne* and *Platycerium bifurcatum* are two of the best Staghorns for house plants.

For delicate ferns it is very hard to beat the Maidenhair Ferns or Adiantums (Figure 7) both for beauty and the care it takes to keep them in good condition. They are fussy ferns requiring a sun-free bright spot with high humidity and often do best in a terrarium or under light units with many companion plants. Characteristically, they have black wiry stems and masses of small, very thin dainty leaves.

Adiantum raddianum is a tiny leafed plant with dark green foliage. *Adiantum raddianum* 'Pacific Maid' is very compact with beautifully layered leaves. *Adiantum tenerum* 'Wrightii' the Fan Maidenhair has lovely new pink fronds turning green at maturity. *Adiantum caudatum* is a true oddity whose fronds take root and develop plantlets so being called the Walking Maidenhair.

Of the small ferns, few have the depth of color or the toughness of the Button Fern from New Zealand *Pellaea rotundifolia*. In its natural habitat it grows on cliffs and does very well as a ground cover showing a quiet beauty with its normal shiny leaves.

A group of plants erroneously taken for ferns is the Asparagus family. They are usually fluffy and green but they do flower and set true seed placing them a long evolutionary distance from the ferns. *Asparagus myriocladus* the Ming Asparagus is a very striking small leafed bushy plant from South Africa. The new foliage is a fresh green turning darker as it matures. A gracious plant often featured for its bonsai-like appearance. *Asparagus asparagoides* var. *myrtifolius* know as Baby Smilax is also from South Africa and is the old fashioned florists green. It is so old it is seldom grown these days and is now treated as a 'new' plant. It is a rambling vine with very fresh sickle shaped leaves 1.0-1.3 cm wide by 2.4-2.8 cm long.

Another Ming, although from a different family is the Ming Aralia, *Polyscias fruticosa*, from South East Asia. A very glamorous plant with its twisting willowy stems and lovely intricately lacey leaves. It is a tricky plant to cultivate in our climate, but like most of the Araliaceae is well worth the trouble.

The Umbrella Plant or *Cyperus alternifolius* is an overwaterer's dream. A bog plant with slender stems and umbrella spoke-like leaves, it grows palm-like to 12-15 cm ever spreading from the base. *Cyperus alternifolius* var. *gracilis* is a dwarf form to 30 cm and makes a fine wet pot plant. Both are related to Papyrus of Egyptian paper and boat fame.

Continued on page 60.

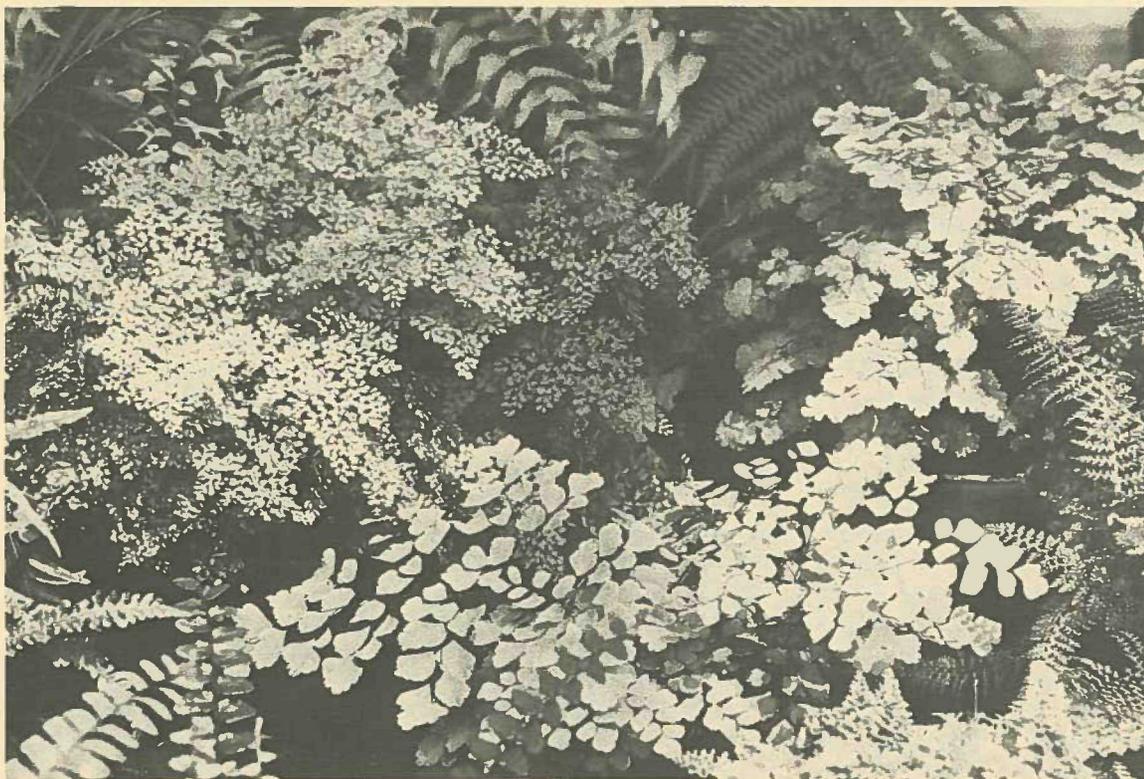


FIGURE 7. A collection of maidenhair ferns.

The Genus *Larix* Adanson in British Columbia

Member of the Family Pinaceae

LARIX LARICINA (Duroi) K.H.E. Koch

Tamarack

LARIX LYALLII Parlatores

Alpine Larch

LARIX OCCIDENTALIS Nuttall

Western Larch

Distribution

The genus *Larix* is widely distributed in North America. *Larix laricina* is one of the most northerly and widespread species, occurring across the continent as far north as the tree line, and south to northern Pennsylvania and the Lake States. It is found from sea level to about 1200 m. In British Columbia it is present only in the northeast, extending as far south as Cassiar Lake (54°40'N), with isolated occurrences at Clucluz Lake (53°55'N 123°30'W), Pantage Lake (53°10'N 123°05'W), Liard River (59°40'N 129°W), Aleza Lake (54°N 122°W), and Chilako River (54°N 123°W). There is also an isolated stand near Vanderhoof.

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Larix occidentalis and *L. lyallii* both have a more southerly range, but grow at different elevations. *Larix occidentalis* occurs from southern British Columbia south on the eastern side of the Cascades to Deschutes County, Oregon, and eastwards to northwest Montana, northern Idaho and northeast Oregon. It is found in mountain valleys and lower slopes from about 750 to 1800 m. In British Columbia it is present on north-facing slopes and in the higher valleys of the Kootenay, Arrow and Okanagan Lake regions as far north as Shuswap Lake, at elevations from approximately 270 to 1350 m. There is one westerly record at Guichon Creek (50°10'N 120°50'W). *Larix lyallii* is a subalpine to alpine species occurring from the Cascade Mountains of southern British Columbia south to the Wenatchee Mountains, Washington, and east to southwestern Alberta, northern Idaho and western Montana. It grows often on north-facing slopes at or near timberline from 1200 to 2250 m. In British Columbia it is found in the subalpine and alpine regions of the Rocky and Selkirk Mountains (in the vicinity of Cranbrook and Kootenay Lake), in the Galton Range, along the Ashnola River and at about 1980 m in Manning Park. Its range extends from 49°N to about 55°N, at elevations from 1200 to 2250 m.

Habitat

Larix laricina is restricted to sphagnum bogs or swamps in the southern part of its range. It is found on moist benches and well-drained uplands further north, but becomes scattered and dwarfed towards the Arctic Circle. Because of its wide distribution the species is present on a wide variety of shallow moist soils and is subject to varied climatic conditions. In general, however, the climate can be described as a cold continental humid climate with a short vegetative season, the ground being solidly frozen for 5-7 months of the year. Where this tree occurs the average annual precipitation is 300-640 mm falling mainly in winter. This larch is common in mixed stands, but rarely found in pure stands as it is intolerant of shade. In parts of British Columbia it is characteristic of damp cool northern slopes.

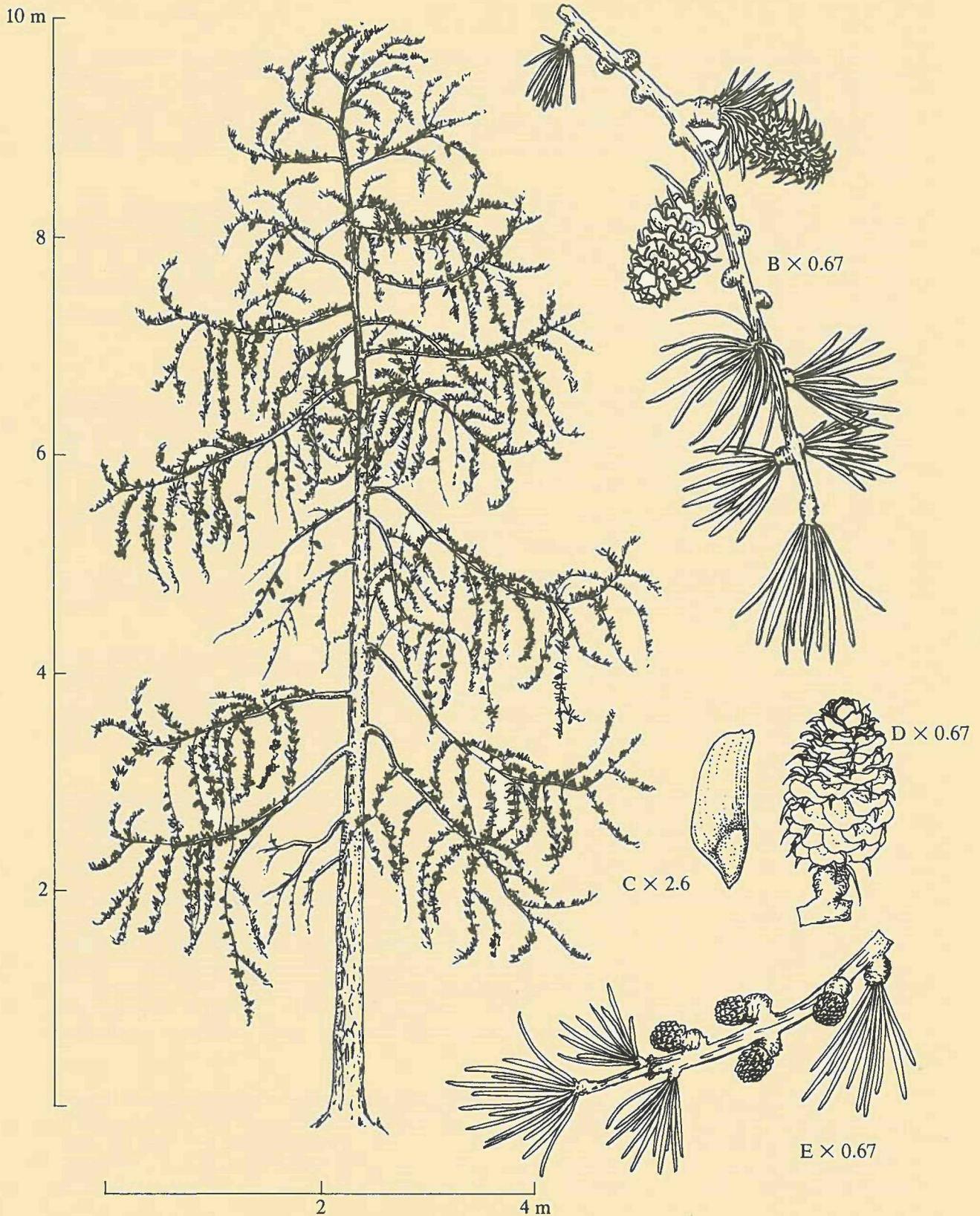


FIGURE 8. *Larix lyallii*. A. Habit of mature tree. B. female cone bearing branch, C. seed, D. mature female cone, E. branch showing male cones.

Larix occidentalis is present on mountain slopes (usually with a northern or western exposure), stream bottoms, valleys and river flats, often in somewhat swampy areas. It prefers a continental montane humid climate with a moderately long vegetative season. Where it occurs the ground is frozen for 2-3 months and the average annual precipitation is (200-) 360-890 mm. This species usually occurs in mixed stands, although small pure stands occasionally develop on deep porous moist soils.

Larix lyallii is a timberline tree of high mountain slopes and plateaus, especially sites with a northern aspect where snow remains late in season. It is often found in passes, and on sheltered sides of crests and divides. It does well on rocky and gravelly soils provided there is abundant soil moisture. This tree occurs in a microthermal continental humid subalpine climate with very severe winters, moderate snow cover, solid frozen ground for an extended period, and an average annual precipitation of 410-1830 mm, mostly in winter. The species usually occurs as scattered individuals or small pure stands, sometimes in open mixed stands.

Description

Larches are our only native deciduous conifers, with an almost delicate appearance. They are 10-80 m tall with an erect tapering trunk, a cone-shaped crown with elongated leading shoots, many irregularly arranged somewhat horizontal branches upturned at the ends, and drooping branchlets. Trees are usually narrow and pyramidal when young, developing wide spreading heads at maturity, but becoming dwarfed, twisted and stunted at higher latitudes and elevations.

The root system is typically widespreading and varies from shallow to deep depending on the species. Often there are many lateral roots, and taproots may develop on the best sites.

The bark is thick to relatively thin, smooth and dark grey or brown when young, becoming deeply furrowed or scaly and reddish-brown with age. The inner bark may be vivid reddish-purple. The bark contains tannin.

The twigs are slender to stout, glabrous or glaucous to strongly tomentose (at least when young), often brittle, and becoming orange-brown during the first winter. Branchlets are of two kinds: a) elongated and slender, growing from a few centimetres to 60 cm per year, with leaves borne singly and spirally arranged; b) short and spurlike, growing only a minute amount per year, with numerous leaves crowded in a terminal tuft. The pith of the twigs is minute, brown, roundish and interrupted at the junctions.

The wood is bright light-red to yellowish-brown with a narrow band of whitish to pale straw-brown sapwood. It is moderately heavy, moderately hard, very strong, fine- to moderately coarse-grained and very durable. It may be somewhat oily and with a greasy feel, although generally without a characteristic odour or taste. It seasons badly and is rather difficult to work but takes a fine polish.

The buds are small and solitary, sessile, globose or short-ovoid, glossy dark red to chestnut brown, and glabrous to densely pubescent at least on the margins of the scales. They are slightly if at all resinous. The scales are numerous, brown, slender to broad, pointed; the inner scales enlarge with age, leaving prominent ringlike scars on the lateral branches. On long branches, buds if terminal, produce long shoots, or if axillary and lateral, they usually produce short shoots or spur branchlets. On the spur branchlets the buds give rise either to a tuft of leaves or to cones. The leaf scars are minute and raised, alternate, half-round or three-sided, mostly clustered on the spur branches.

The mature leaves are of two kinds: a) thin, scalelike, usually tomentose-tipped bracts, occurring mainly at the tips of short spur-like lateral branchlets and at the base of cones, often persistent for more than one year; b) needles, (1-)1.5-4.5(-5) cm long, pale green or yellowish-green to bluish-green, becoming brilliant yellow and orange in the fall, either triangular (rounded above and strongly keeled below) or four-angled. The needles of seedlings and on lead shoots of older

plants are single, spirally arranged and strongly decurrent (running down the twig below the point of attachment), the decurrent portion persisting after the needle drops. Those on the short slow-growing spur shoots are crowded into false whorls of (10-)15-40(-50) at the tip, the needles being broader and more uniform in size than on the long shoots. Foliage development is slow in the spring and may take up to six weeks to attain full growth.

Cones appear from May to July. Larches are monoecious (male and female cones separate but on the same tree). The cones are solitary and terminal on the spur branches, often close together. The male strobili are globose to cylindrical, sessile or stalked, 5-20 mm long, with numerous yellow, short-stalked microsporangia, and growing on leafless, mainly one- to two-year-old branches. The female strobili are globose to oblong, erect, stalked, about 12 mm long, usually red or purple but occasionally green, with few to many, green and nearly orbicular stalked scales growing in the axils of much longer bracts. The bracts are mucronate, often recurved, and usually scarlet (sometimes pale or white). The female strobili appear with the leaves, often adjacent to male strobili, and are each surrounded by a bundle of leaves. They occur on (1-)2-4(-10)-year-old wood.

The cones are green, reddish or purplish to ultimately brown and woody, (0.8-)1-4.5(-5)cm long and 0.5-3.0 cm wide, ovoid-oblong to conic or subglobose, erect and short-stalked. Cone scales are persistent, few to numerous, slightly thickened, stalked, concave, and suborbicular or oblong-obovate. The small scales at the ends of the cones are usually sterile, the remainder each bearing two seeds. The bracts thin, long-caudate, acute to retuse, often conspicuous. The cone matures in one season, releasing seed in the fall or the following spring, but then persists as a unit on the tree for 1-5 years.

The seeds are about 3 mm long, nearly triangular, rounded on the sides, oblong or obliquely obovate, light brown and without glands; the wing is often twice as long as the seed, thin and cuneate. Trees begin to produce large quantities of seed at about 40 years and production may continue for as long as 300-400 years (e.g., *L. occidentalis*). Good crops are produced at irregular intervals of 1 to 6 years.

Larix occidentalis is a large handsome tree, 30-50(-80)m tall with a DBH of 2-2.5(-4.5)m, the trunk tapering and ultimately bare, and usually with a short, narrow, open pyramidal crown. The root system is deep and widespreading with many laterals. The bark at maturity is 10-15 cm thick, light cinnamon-red, furrowed into large plates which flake into scales. The twigs are dark grey-brown and brittle. The buds are dark chestnut-brown. The needles are (2-)2.5-4.5(-5) cm long, (12-)15-30(-40) per cluster, pale green, triangular and fairly stiff and sharp-pointed. Cones appear in May or June; the male strobili are globose to cylindrical, sessile or stalked, the female cones oblong, reddish-yellow to purplish-green when young, with orbicular and nearly sessile scales. Cones are 2.5-3(-3.5) cm long and 2.5-3.0 cm broad, short-stalked purplish-red, becoming reddish-brown at maturity. The scales are ciliate when young, their margins sometimes reflexed; the bracts are conspicuously protruded, abruptly contracted into mucronate tips. The seeds are 6-9 mm long, pale brown to reddish, with a pale brown wing 12-18 mm long and rounded at the apex. Viable seed bearing is infrequent at less than 25 years, abundant at 40-50 years and continuing for 300-400 years.

Larix laricina is a tree 15-24(-34) m tall, with a DBH of about 1 m and with (usually) a narrow regular pyramidal crown which may become broad and open, and frequently picturesque, if the tree has grown in the open. The root system is shallow, compact and very widespreading, especially on favourable sites; tap roots are sometimes formed. The bark at maturity is reddish-brown and is 1.2-2 cm thick and forms small, rounded, closely appressed scales. The twigs are brittle, glossy reddish or dull-brown. The buds are lustrous dark red. The needles are 1-2.5(-3) cm long, 12-20 per cluster (36-45 in one tree at Liard Hot Springs, B.C.), bright green, triangular and soft. Cones appear in early spring; male strobili are sub-globose and sessile and female strobili are oblong, crimson or red (rarely greenish) with nearly orbicular, rose-red scales. Mature cones are 1-2 cm long and 0.6-1.2 cm broad, on stout incurving chestnut-brown stalks; the cone scales are glabrous, with margins curving inward; the bracts are concealed. The seeds are about 5 mm long,

brown with a wing about 7 mm long, light chestnut brown and rounded at the apex. Viable seed bearing begins at 12-15 years, is abundant at about 40 years and reaches an optimum at 75 years; the best cone crops are produced between 50 and 150 years. Good crops are produced at irregular intervals of 3 to 6 years.

Larix lyallii is very similar to *L. occidentalis* in many respects and has been considered a variety of that species by some authorities. It differs from *L. occidentalis* as follows: it is a small, often dwarfed or misshapen tree, (6-)10-15(-25) m tall with a DBH of 45-55(-60) cm and with an unsymmetrical pyramidal crown. The root system is firmly anchored. The bark at maturity is dark red-brown, rarely more than 2 cm thick. The twigs are tough and wiry, densely white- or yellowish-tomentose at first, the tomentum ultimately becoming blackish. The buds are brown with conspicuous long, white, matted hairs fringing the scales and often almost covering the bud. The needles are (2-)2.5-3.5(-4) cm long, 15-40(-50) per cluster, light bluish-green, rigid, short-pointed and four-angled. Cones appear June-July. The cones are (3)3.5-4.5 cm long and 2 cm broad, nearly sessile or slender-stalked, dark purple to greenish-red; the cone scales are densely tomentose and the bracts long-pointed and conspicuously protruding. The seeds are 3-4 mm long, purplish or yellowish to light brown, the wing 6-8 mm long, light red, and broadest near the base with nearly parallel sides. Very little is known about seed-bearing in this species; abundant cone production apparently occurs at infrequent and irregular intervals.

Key to the Species in British Columbia

Cones usually less than 25 mm long; subglobose to ovoid; cone scales longer than bracts; leaves triangular; distribution in northern B.C., seldom found south of 53°N *L. laricina*

Cones usually more than 25 mm long, elongated; cone scales shorter than bracts; leaves triangular or four-angled; found in southern B.C.

Young branches strongly tomentose, hairs long and tangled; needles four-angled; usually with 2 small resin ducts; ovulate cones usually at least 3.5 cm long; trees subalpine or alpine, often at or near timberline *L. lyallii*

Young branches glabrous to somewhat pubescent, but hairs short and not tangled; needles triangular, without resin ducts; ovulate cones rarely as much as 3.5 cm long; trees of foothills to middle elevations, rarely subalpine *L. occidentalis*

Propagation

Seeds germinate fairly readily (germination 40-50%) and retain their viability quite well. Once it is ripe, the seed should be stratified 3 to 5°C at least for 21 days, then sown evenly and thinly under a light covering of soil in unheated frames. The seeds may be stored in an airtight container in a cool place for up to a year before stratification.

Softwood cuttings have occasionally been used to propagate larches but have proved difficult to root.

Rarer larch varieties are grafted in spring on seedlings of either the same species or *L. decidua* Miller, the Common or European larch.

In nature, layering may occur in *L. laricina* when low sweeping branches are covered by fast-growing sphagnum moss or soil. The roots of this species have been known to produce shoots. This is not known in the other two species.

Seedlings should be kept shaded and provided with ample moisture but should have good drainage. They may be planted out when approximately 45 cm tall.

Transplantation

Larix lyallii is difficult to transplant from the wild, as are many alpine plants. This difficulty may be due as much to its inability to adapt to lowland habitats, as to the shock of transplanting. The other two species both transplant quite easily during their dormant period.

Conditions of cultivation

The growth rate of *L. occidentalis* is rapid once seedlings have become established, achieving 100 to 200 cm at 4 years and up to 50 cm per year between the ages of 14 and 20 years. The trees are mature at about 300-400 years although trees more than 700 years old have been reported. *Larix laricina* shows moderate to rapid growth (depending largely on moisture conditions), reaching at least 18 m in 45 years under ideal conditions. The trees are mature at about 100 years and the maximum age attained is generally 150-180 years although one tree 335 years old has been reported. *Larix lyallii* exhibits slow growth because of its habitat with maximum growth about 15 m at 100 years. Trees with DBH of 50 cm are 450-500 years old. This species is long-lived, and exceptionally large trees may be more than 700 years old.

The recommended hardiness zone (Scherk & Buckley, 1968) is Zone 1a for *L. lyallii* and *L. laricina*, and Zone 3a for *L. occidentalis*, all cold winter climate areas. Larches are adaptable to most soils, particularly good loamy soils combined with abundant rainfall. *Larix laricina* succeeds in damp areas, whereas the other species prefer well-drained exposed sites. All will grow on rocky or gravelly soils but show best growth on richer soils of pH 5.5-7.6 and a good supply of calcium. All species are intolerant of shade, but this is partly compensated for by the rapid early growth. Generally trees require little pruning, particularly if grown in the open. Any necessary pruning should be done while the trees are still dormant to minimize "bleeding" from the cut surface.

Landscape Value

The larches are handsome trees of regular pyramidal habit, becoming sometimes irregular in old age. They are chiefly grown as ornamental trees for their bright, light green foliage and colorful new cones in spring, and the brilliant golden-yellow foliage in the fall. In addition, the old cones add interest to the bare branches in winter. They are often planted as park trees, and are particularly attractive if planted against a background of dark evergreen conifers or near water for reflection. They will succeed in open airy positions or on rocky hills or mountainsides, and prefer a northern or eastern exposure.

Larix lyallii, like many alpine plants, may be difficult to establish in a lowland garden, but can become a splendid tree, often attaining a large size with beautiful symmetry. *Larix laricina* is of special interest because it is one of the hardest of all trees, although it is perhaps not as satisfactory in cultivation as the other larches. It should perhaps merit more attention, because of its rapid growth and the large size it attains in cultivation. *Larix occidentalis* is of use largely in the west, although well-grown trees are known in the eastern states. It does not thrive outside its own range, but within that range it is equal if not superior to the European larches. Larches are susceptible to high air pollution and develop a ragged appearance under such conditions.

Availability

Larix laricina and *L. occidentalis* are available from a few nurseries in the U.S. *Larix lyallii*, which has a restricted range, is not readily adaptable to lowlands and is not available commercially.

Varieties and Ornamental Cultivars

Races and hybrids are not known except in *Larix laricina*. Occasional trees intermediate in character between *Larix occidentalis* and *L. lyallii* have been reported, suggesting that these two species may hybridize. However, the two species are sharply distinctive, and in general, their habitats do not overlap.

Several forms and cultivars of *L. laricina* are known but only a few are still in cultivation and even these are not common. Three natural forms of this species (f. *depressa*, f. *lutea* and f. *parvistrobis*) originated in North America, whereas the cultivars 'Aurea' and 'Glaucua' arose in gardens in Europe.

The Tamarack in northern Alaska is stunted, with a much reduced crown, very short leaves and narrower bracts on the cones. It has been described as a separate species (*L. alaskensis* Raup) but is generally accepted as a variety of *L. laricina* (var. *alaskensis* (Wight) Raup).

Larix × pendula (Solander) Salisbury ('Weeping Larch'), derived from *L. decidua* and *L. laricina*, is a large tree with long pendulous branchlets and shoots which are glabrous and pinkish when young, becoming purplish in summer. Its leaves differ from *L. decidua* and it differs from *L. laricina* in having larger cones. The tree was originally described in 1789 as *L. pendula*, from a specimen at Ridgway House, Mill Hill, London, and believed to be native to North America. It is now generally believed to be a garden hybrid which probably originated at Peckham between 1730 and 1750, and was then transplanted to Mill Hill.

A tree of *Larix × pendula* 'Repens' was planted about 1800 at Henham Hall, Suffolk. In 1963 the tree was 2.75 m tall with a spread of 37 m by 28 m, and at one time the branches were supported by 100 posts. It is now believed to have been grafted onto European Larch stock.

Other Uses

Several species of larch are valuable timber trees, and the wood is in constant and increasing demand because of its durability when exposed to air and moisture. The bark contains tannins which can be extracted and used in tanning leather.

Larix occidentalis is the most important tree of the genus, and is an important timber producing tree in western Canada. Because of its durability, the wood is largely used for building construction, ties, poles and posts. It works well and takes a fine polish so it is also used for cabinet making and interior and exterior finishing, as well as for pulp. It is considered one of the best fireplace fuels. The wood is similar to, and sometimes sold as, Douglas-fir. The butt logs are so heavy and frequently so full of defects that they are often left in the forest, but when pulped they are suitable for the production of high grade wrapping paper. Galactan, a water-soluble gum which is present in the wood in large quantities, especially in butt logs, can be easily extracted and oxidized into mucic acid which is used in baking soda. Oleoresin is also present and can be used to produce 'Venice' turpentine and related products.

Grouse apparently often eat the fallen leaves of larches. The Thompson Indians in British Columbia used a decoction of *L. occidentalis* as a wash or bath for babies, believing that it would make them strong and healthy. The gum which is exuded from the trunk and branches was chewed.

The wood of *L. laricina* is also used for posts, poles, railway ties, boxes and crates, and pulpwood. On drier sites, the roots of larger trees bend sharply from the trunks to form knees, which were much in demand in the days of wooden ships for joining the ribs to the deck timbers.

The wood of *L. lyallii* is as durable as that of the other species, but is of no commercial importance because of its inaccessibility. Trees are cut only if they happen to be associated with other species of greater value.

Diseases and Problems of Cultivation

All three species are moderately windfirm and will be thrown only in very moist sites. The trees are moderately resistant to fire damage, being protected by the relatively thick bark (although young trees are easily burnt). *Larix laricina* and *L. occidentalis* have brittle branches which may break easily under weight. All species are intolerant of shade, particularly when young, and require a considerable amount of toplight throughout life. Prolonged flooding of the site may cause death of the crown or of the whole tree.

Under natural conditions, both insects and fungi cause damage to larches. An important disease-causing fungus is *Dasyscypha willkommii* or *D. calycina* (Canker), indicated by drops of resin around swollen bark lesions. Trees are very susceptible to these fungi if planted close together and the spring season is particularly wet. All infected bark should be cut and burned. *Fomes laricis* (Quinine fungus), *F. officinalis* (Brown trunk rot), and *Trametes (Fomes) pini* (Ring scale fungus) cause red heart or redring rot, and *Polyporus schweinitzii* (Velvet top fungus) also affects the wood.

Melampsora medusae (Conifer-aspen rust), *M. occidentalis* (Conifer-cottonwood rust) and *M. paradoxa* (Larch-willow rust) all affect the needles and leaves of their hosts. If larches in ornamental plantations are valuable, remove the alternate host from the area.

Hypodermella laricis (Needle cast) causes brown needles in summer, which last over the winter.

Arceuthobium pusillum and *A. campylopodium* f. *laricis* (Dwarf mistletoe) can cause considerable damage and the production of witches' brooms, which may break the affected branches if they get too large and heavy.

Coleophora laricella (Larch moth or Larch casebearer) is probably the most serious insect pest; *Pristiphora erichsonii* (Larch Sawfly) can also cause serious damage, defoliating stands over large areas for several successive years. Growth of the tree is greatly reduced and mortality may be severe.

Snowshoe hares and whitetailed deer occasionally browse on the seedlings in nature.

Origin of the Name

The generic name *Larix* is the ancient Latin name used by Dioscorides for the European species (*L. decidua* Mill.). Possibly the name is derived from *lar*, meaning 'fat', because the tree produces resin. The specific name *laricina* means larch-like (the species was originally placed in the genus *Pinus*). *Larix lyallii* was named in honour of its discoverer David Lyall (1817-1895), Scottish surgeon and naturalist on various British expeditions and surveys. The specific name *occidentalis* can be directly translated as 'of the western world'.

Larix laricina was introduced into cultivation in Great Britain in 1739, and may have been previously cultivated in North America. The Iroquois Indians called the tree 'Ka-neh'tens' or 'the leaves fall'.

Larix lyallii was introduced into cultivation in the British Isles in about 1904 but has proved to be a poorly adaptable species. The type locality is in the Cascade and Rocky Mountains at elevations between 2,100 and 2,300 m.

Larix occidentalis was discovered at Kettle Falls along the Columbia River by David Douglas in 1826, but was not introduced into cultivation until Dr. Sargent sent seeds to the Arnold Arboretum in 1880 and to Kew Gardens in 1881. The type locality is "In the coves of the Rocky Mountains, on the western slope towards the Oregon."

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Edible figs are members of a large and varied family including the Creeping Fig, Rubber Tree, Fiddle-leaf Fig, Moreton Bay Fig, Weeping Fig and Mistletoe Fig. *Ficus benjamina*, the Weeping Fig, is perhaps the most popular of all the large houseplants. It has a distinct tree appearance with an abundance of small shiny green leaves. The more leaves produced, the more the shrub weeps, but during seasonal changes the shrub will drop and replace its leaves very readily making it appear a temperamental plant. It prefers a good tight root ball, good light and warmth without heat and humidity in large amounts. If Weeping Fig is grown as a standard tree, as opposed to a regular bush, it is a stunning plant giving a light gracious effect.

A completely different fig is the Mistletoe Fig, *Ficus diversifolia*. The wandering woody branches produce tough dull, green leaves and small 'figs'. It is an easy plant to train and prune into interesting shapes and makes a good hobby plant over the years.

Dryland or desert plants (e.g., Cactus and other succulents) with interesting form are numerous and very interesting to grow but many do not fall into the description 'tropical'. *Rhipsalidopsis rosea* from Brazil is an epiphyte from a marginal dryland area and is an excellent cactus to grow in the home. Its small, shrubby, and much-jointed habit has rose-colored foliage when grown in bright light. The blossoms are rose pink and can easily be induced by a cold dry period during the winter months and ample water and food in the spring.

Opposite

Rhapis humilis, the Slender Lady Palm, is a graceful bamboo-like plant. The stems are covered with dark brown fibers. The species differs from the Large Lady Palm, *Rhapis excelsa*, in being taller and possessing 10-20 leaf segments that are considerably narrower than those found in *Rhapis excelsa*. Both species are graceful plants with many stems. These plants make excellent pot plants and are best grown in rich soil with shade.

Climatological Summary for 1975*

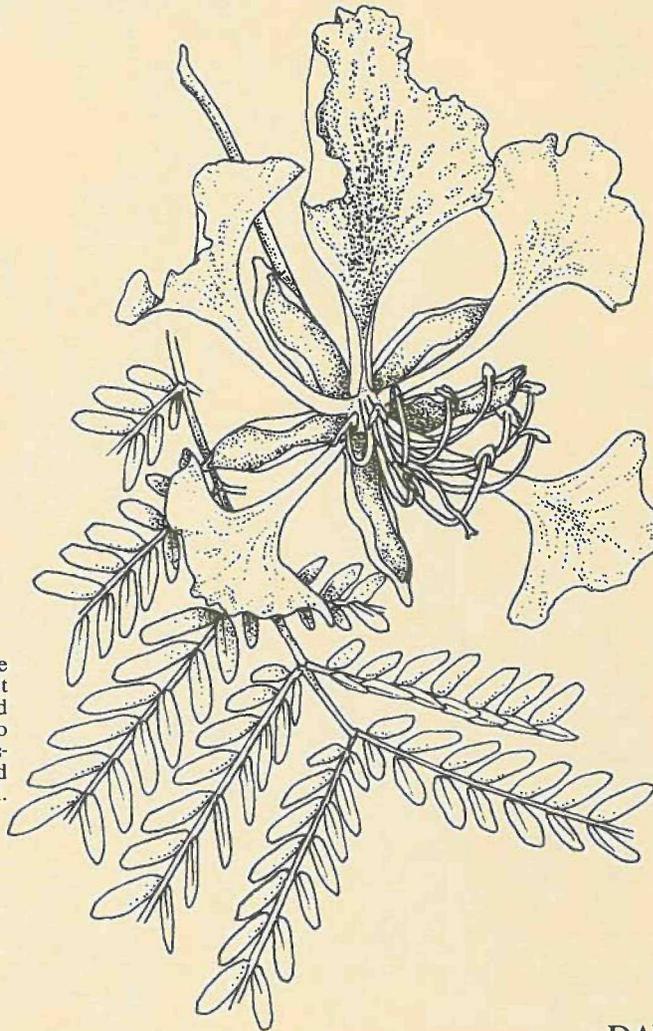
The weather in 1975 can best be described as being typical of the Vancouver area. While some slight variations can be shown such as the mean temperatures in February and April being the lowest in the past fifteen years and in October and November the highest temperatures for the same fifteen year period were recorded, the weather was remarkably consistent. Two items are, however, worthy of note: 1) The total rainfall in September of 0.8 mm was the lowest recorded in any one month period, and 2) the lowest recorded grass minimum temperatures in June, July and August in the 1960's were generally 4 to 5°C, whereas those in the 1970's with two exceptions have only been 1 to 2°C. Conversely the extreme maximum temperatures for the same period show a slightly higher average in the 1970's than those in the 1960's.

Data	1975	OCTOBER	NOVEMBER	DECEMBER
Mean temperature		9.6°C	5.5°C	3.8°C
Highest temperature		25.0°C	16.7°C	12.2°C
Lowest temperature		1.7°C	-5.6°C	-5.6°C
Grass minimum temperature		-3.3°C	-11.7°C	-10.0°C
Total rainfall/No. days with rainfall		300.9 mm/23	208.3 mm/21	205.2 mm/16
Total snowfall/No. days with snowfall		0	114.3 mm/2	248.9 mm/2
Total hours bright sunshine/possible		73.2/318.43	57.3/268.23	70.3/253.11
Max. wind speed in km for 1 hour/direction		27.4/SE	32.2/SE	24.2/SE
Mean kilometers of wind at 1 m		151.9	150.1	124.3
Mean kilometers of wind at 13 m		214.2	221.7	179.9

*Site: The University of British Columbia, Vancouver, B.C., Canada
 Position: lat. 49° 15'29"N; long. 123° 14'58"W. Elevation: 104.4 m



Delonix regia, the Royal Poinciana or Flame Tree, is one of the world's most elegant ornamental flowering trees. It is widely used throughout tropical regions although native to Madagascar. It is a plant that can be successfully grown indoors and by careful pruning and proper maintenance can be flowered.



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