**Lactuca sativa**, lettuce

**Taxonomy**

**Brief facts**

- Lettuce is an annual or biennial plant most often grown as a leaf vegetable. It was cultivated from the time of Egyptian Pharaohs and, presently, is one of the most important leafy crops worldwide.

- Lettuce leaves contain small amounts of opiate-like substance, lactucarium ("lettuce opium"), which is a mild sedative. Our ancestors used lettuce to treat anxiety, insomnia, and neurosis. Lettuce is rich source of antioxidants such as quercetin, caffeic acid, vitamins A and C. It was shown that ethanol extract of lettuce injected subcutaneously, significantly decreased accumulation of lipofuscin pigment granules ("age granules") in brain of mice under accelerated ageing regimen (the mice were administered D-galactose).

- Lettuce originates from the wild Lactuca serriola found in the Mediterranean and Near East and has been transformed from cellular organisms - Eukaryota - Viridiplantae - Streptophyta - Streptophytina - Embryophyta - Tracheophyta - Euphyllophyta - Spermatophyta - Magnoliophyta - eudicotyledons - core eudicotyledons - asterids - campanulids - Asterales - Asteraceae - Cichorioideae - Cichorieae - Lactuca - Lactuca sativa
an erect plant with bitter leaves to various cultivars including ones with distinctive heads of chlorophyll deficient leaves. Other wild relatives of genus *Lactuca* (*L. aculeata*, *L. scarioloides*, *L. azerbaijanica*, *L. saligna* and others) also most likely contributed to the cultivated lettuce gene pool. Usually, the wild species lanraces are only partially cross-fertile with *L. sativa*. Occasional inter-species hybrids are used to introduce disease resistance genes into garden lettuce's stock.

**Morphological types of *L. sativa* (Lebeda et al. (2007))**

1. **Butterhead lettuce**: loose head with soft and tender leaves, eaten raw; very popular in Europe and USA.
2. **Crisphead lettuce**: heading type with thick crisp leaves and fan-like (flabellate) leaf venation, eaten raw.
3. **Cos lettuce** (named after Greek island Cos): tall loose heads; oblong rigid leaves with a prominent midrib; eaten raw or cooked. Often, Cos lettuce cultivars are sold as "Romaine lettuce".
4. **Cutting lettuce** (Gathering lettuce, Loose-leaf, Picking lettuce, Schnittsalad): non-heading type, harvested as whole, as open rosettes, and, occasionally as separate leaves; eaten raw. Cultivars vary widely in leave shape and coloration - from flat to curled, from smooth-edged to fringed, from plain green to decoratated with patterns of various intensities of anthocyanin pigmentation.
5. **Stalk (Asparagus) lettuce**: plants with swollen stalks, which are eaten raw or cooked like asparagus; very popular in China and India.
6. **Latin lettuce**: loose heads with dark green thick leathery leaves; eaten raw; mainly cultivated in the Mediterranean countries, including North Africa.
7. **Oilseed lettuce**: characterized by a high percentage (35%) of oil in the
seeds, which is used for cooking; in Egypt, cultivation of oil-seed lettuce has continued to the present time.

**Most important lettuce diseases**

- Lettuce mosaic virus (LMV)
- Lettuce downy mildew (*Bremia lactucae*)
- Lettuce drop (*Sclerotinia spp.*)
- Lettuce shot hole or ring spot (*Microdochium panattonianum*)
- Bottom rot (*Rhizoctonia solani*)
- Pythium wilt (*Pythium spp.*)
- Botrytis blight or gray mold (*Botrytis cinerea*)
- Lettuce powdery mildew (*Golovinomyces cichoracearum*)
- Septoria leaf spot (*Septoria spp.*)
- Aphids: Green Peach Aphid (*Myzus persicae*), Lettuce Aphid (*Nasonovia ribisnigri*), and Lettuce Root Aphid (*Pemphigus bursarius*).

**Developmental stages (life cycle)**

- **Seed stage** MeSH
  - Dormant seed
  - Germinating seed MeSH

  The germinating seedling may take up to 5 days to emerge.

- **Vegetative**
Seedling MeSH

Young plant (1-2 weeks). Soaking seeds or seedlings in ethanol and methanol solutions have been reported to stimulate germination and biomass accumulation in some plant species. It was shown that lettuce 2-true-leaves stage seedlings dipped in 10-15% ethanol solution for 2 minutes produced ~20% more biomass than not dipped seedlings.

Head formation

Corresponds to rosette stage in other plants; when head is fully formed and grown, plant considered to reach vegetative maturity and ready for harvest (from 45 days after emergence for Prizehead lettuce to up to 90 days for Salinas lettuce); loose-leaved varieties are harvestable sooner than tight-head varieties. Exposure to lower night temperatures increases leaf flesh biomass and dry weight per unit of leaf area by facilitating leaf thickening and spongy layer development.

Bolting

Further vegetative growth and rapid growth of stem; this period lasts approximately another 30 days; the lettuce is harvested before it bolts.

Reproductive

Flowering

Approximately 2 months after emergence; when lettuce blooms its stem lengthens and branches, and it produces many flower heads that look like those of dandelions, but smaller. Flowering plant can reach height of up to 1 meter.
Ripening

Seed ripening starts in 11-13 days after opening of the flower head.

Lettuce growing at George Washington’s Mount Vernon garden
References

Articles


- EGUCHI H et al. **GROWTH OF LETTUCE PLANTS (LACTUCA SATIVA L.) UNDER VARIABLE-VALUE CONTROL OF AIR TEMPERATURE BY USING NATURAL LIGHT INTENSITY AS FEEDBACK SIGNAL.** Biotronics 26, 13-20, 1997

● DESHMUKH AA, GAJARE KA, AND PILLAI, M. M. PROTECTIVE EFFECTS OF ETHANOLIC EXTRACT OF LACTUCA SATIVA LINN. (LETTUCE) ON NEURONAL LIPOFUSCINOBENESIS IN D GALACTOSE INDUCED AGEING ACCELERATED FEMALE ALBINO MICE. Journal of Herbal Medicine and Toxicology 1 (2) 43-47 (2007)

● Biscaro GA et al. GERMINATION AND DEVELOPMENT OF AMERICAN LETTUCE SEEDLINGS (Lactuca sativa L.) IRRIGATED WITH HOME AND INDUSTRIAL EFFLUENT-RECEIVING WATER. Irriga, Botucatu, v. 9, n. 3, p.207-216, 2004


● Contreras S, Tay D, Bennett M. Effects of temperature during seed development in Lactuca sativa and Helianthus debilis.

● LACTUCA SATIVA Linn.


Websites

● Wikipedia: Lettuce

● Lactuca sativa (garden lettuce) | USDA PLANTS

Last updated 07/24/09
nemose@live.com