

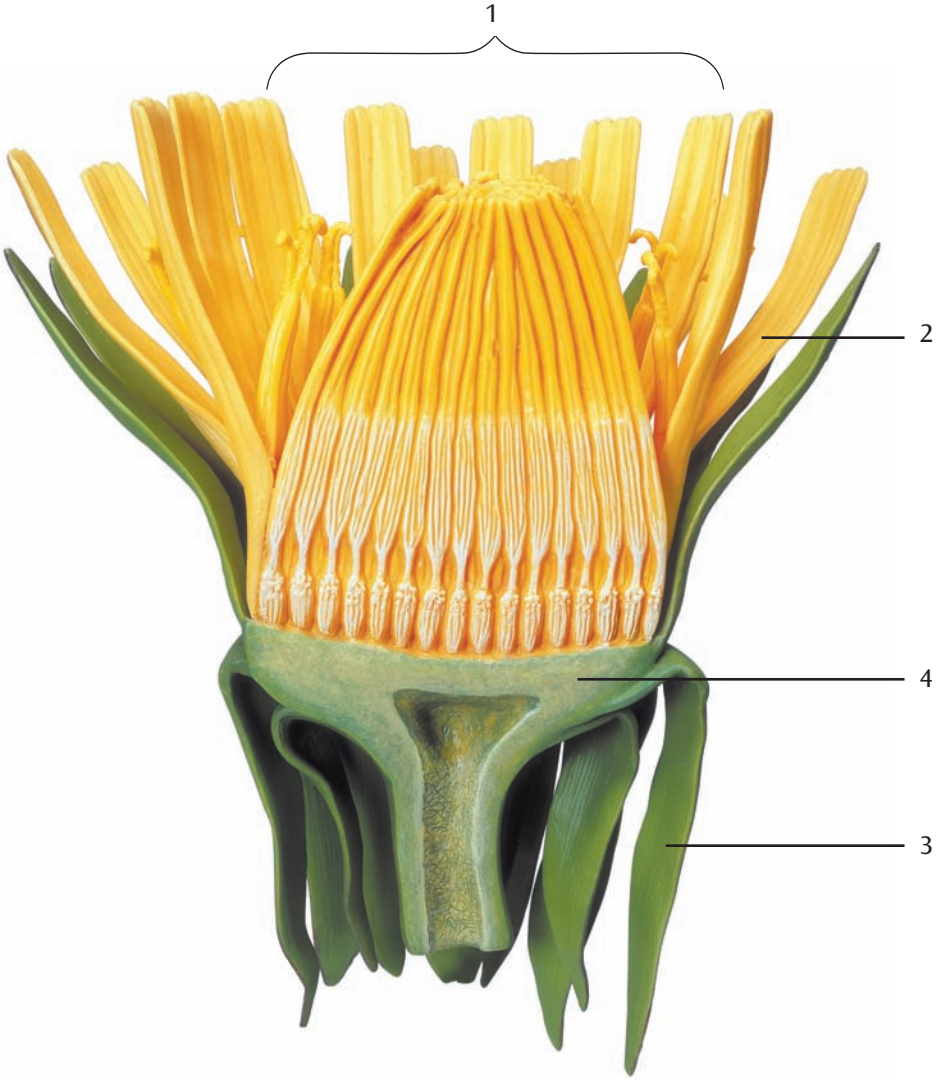


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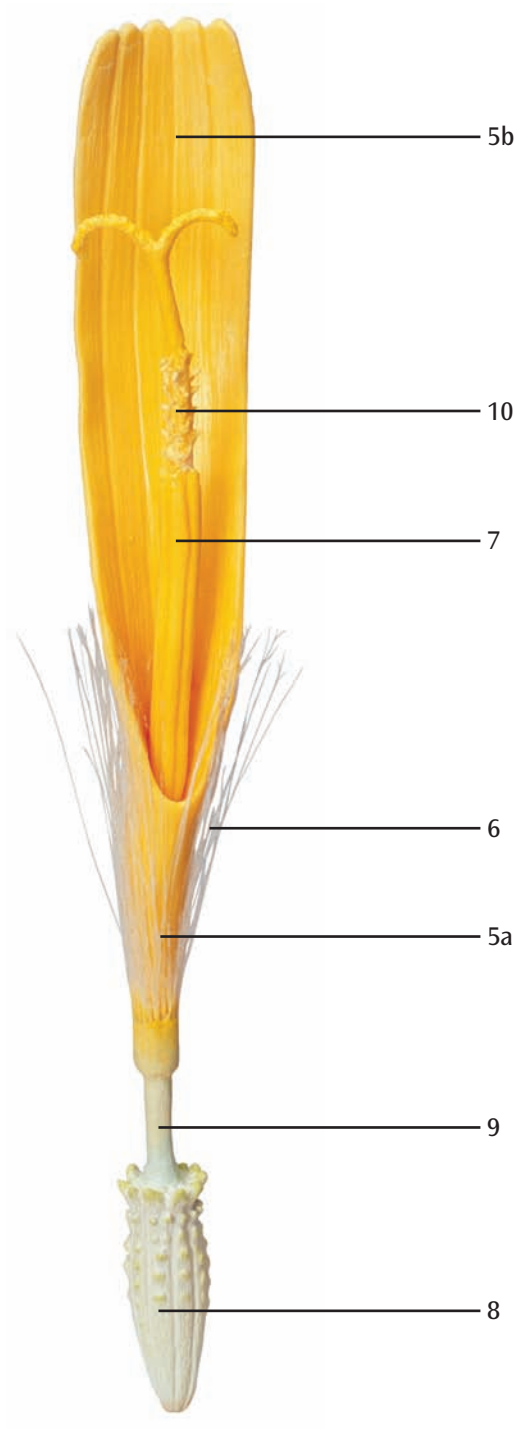


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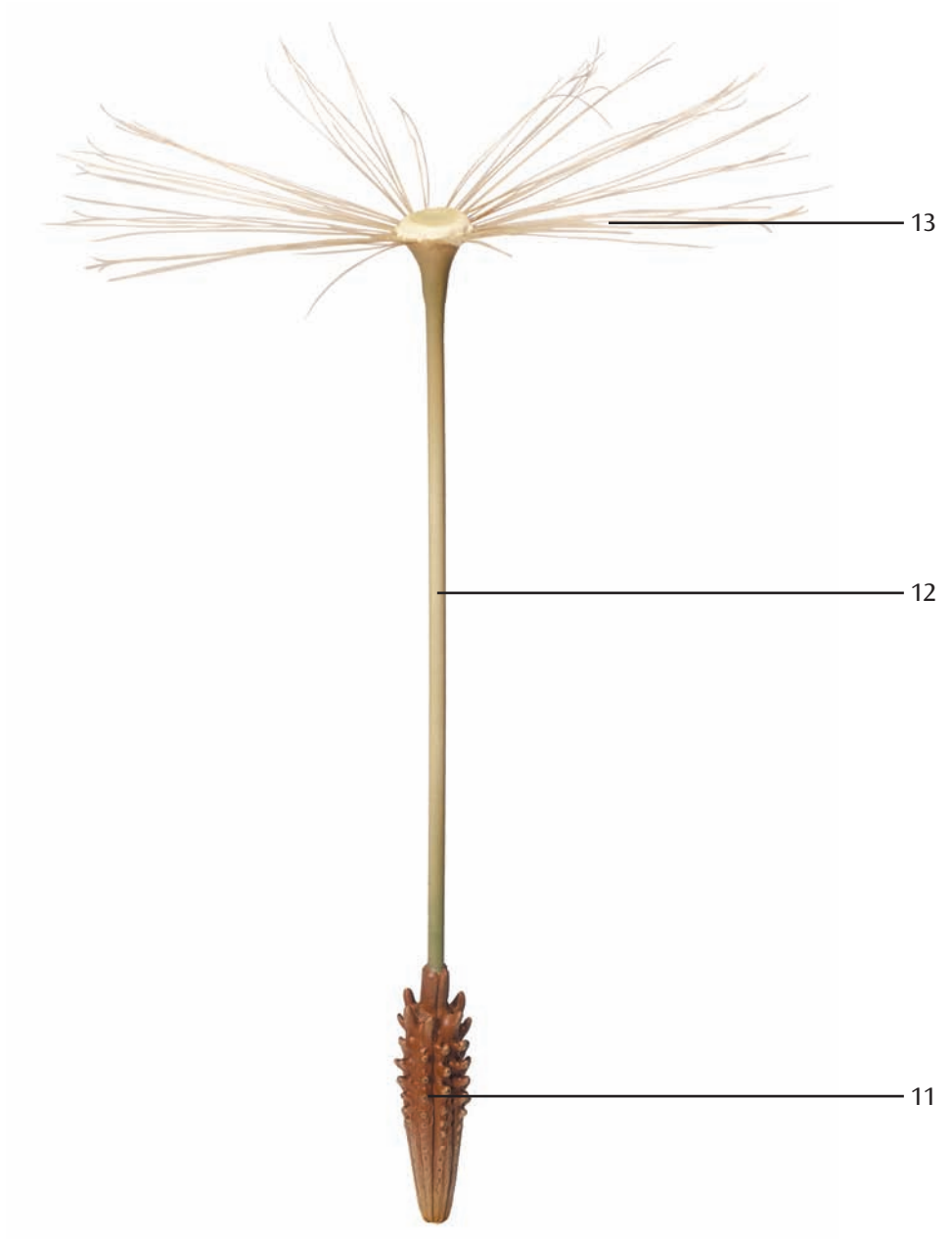
A



B



C



Dandelion

(*Taraxacum officinale*)

English

General

Dandelion belongs to the family of composites whose representatives are found throughout the world. This mainly herbaceous family also includes flowering plants, small trees, and succulents, the latter being particularly prevalent in tropical regions. Composites are characterized by numerous florets arranged in a dense inflorescence that is enclosed by overlapping green leaves known as bracts. The florets have five lobes, while the corollas are fused and either radiate regularly (tubular florets) or extend to one side and are strap-shaped (ray florets). The flower heads consist of tubular corollas, strap-shaped corollas, or both types.

Dandelion displays a great variety of forms and are prevalent throughout the world in fertilized meadows, cultivated fields, and at the edges of paths. Dandelion thrives in nitrogen-rich loamy or clayey soil. Large-scale dissemination is promoted by overfertilizing (nickname: lion's tooth). Dandelion grows to a height of 5 to over 50 cm depending on the amount of bioavailable nitrogen. The plant is a rosette-shaped perennial that contains a milky sap. The flower head is borne singly on a hollow bare stem. The short rhizome transitions into an up to two meter long and sometimes thickened taproot that can make dandelions difficult to eradicate. Dandelions flower from March through October.

The word dandelion refers to the large tooth-like indentations on the plant's leaves and the bright yellow color of its flower head, which is reminiscent of a lion's mane. The plant's yellow coloring agent, carotenoid, was at one time used as a color additive for butter (nickname: buttercup). This coloring agent is embedded in the chromoplasts of the dandelion's cells.

The dandelion's tender young leaves are used in salads and have a diuretic effect (nickname: pee-the-bed). Dandelion contains a milky sap that is used in herbal medicine to purify the blood, for stomach ailments and to treat gall bladder and liver disorders. The active ingredient is the bitter glycoside taraxacin. *Taraxacum*, the botanical name for dandelion, comes from the Arabic word for "wild chicory." Dandelion sap is toxic and a skin irritant. In earlier times the fleshy roots were sometimes roasted in the autumn and used as a substitute for coffee. In autumn dandelion consists of up to 40% inulin, a polysaccharide that the plant stores in its roots for use as a carbohydrate in the spring.

Inflorescence (10 x lifeseize) (Fig. A)

The inflorescence (1) of the dandelion is 2 to 6 cm in diameter, and its up to 200 florets are enclosed by two rows of green leaves known as bracts (3). The outer leaves bend downward long before the plant flowers, while the inner leaves remain upright and protect the florets. The bracts close at nightfall and in inclement weather, thus enabling the flowerheads to be exposed during sunny and clear weather and enclosed at other times.

The florets (2) rest on the flat base (4) of the flower head. The subtending scales (palea) that are characteristic of composites are absent in the dandelion. Since each floret in the inflorescence is strap-shaped, the dandelion is classified as a liguliflorae (composite with a strap-shaped floret).

Dandelion

(*Taraxacum officinale*)

Florets (20 x lifesize) (Fig. B)

Each floret has five lobes. The five golden yellow corollas are fused and form a narrow tube in the lower section (5a). The upper section has a flat “strap” (5b). These ligulate florets are zygomorphic, i.e. they are made up of one longitudinal surface constituted by two symmetrical halves. The strap-like shape is formed by all five corollas.

The calyxes are modified as white bristles on the ovary summit (pappus) (6). The stamens are arranged in a circle (isotemenous androecium). The long and slender anthers are fused so as to form a narrow column around the style (7) (anther column). Only the short uppermost section of the anther (just beneath the anther column) is free. The filaments on the lower section of the anther are fused with the narrow corolla tubes.

The ovary is inferior (8). Dandelion seeds have a beak that forms a thin barrier at the tip between the pappus and the seed-bearing part of the fruit (9). The upper segments of the styles and the outer surfaces of the stigmas have rough papillas (10).

The flowers are protandrous, i.e. the stamens mature before the carpels. The anthers deposit pollen in the anther columns very early, often in the late budding stage. While the dandelion is flowering, the styles extend, pushing the pollen upwards and out of the anther columns. In this process, the rough papillas serve as pollen “bristles” on the upper segments of the styles (10) and the exterior surfaces of both stigma lobes. The pollen is helped out of the anther columns by a concurrent shortening of the upper free sections of the filaments. Thus, the pollen is not presented in the anthers but is instead made available on the external surfaces of the stigma lobes and in the distal openings of the styles (secondary pollen presentation). The dandelion’s “male” stage only comes to an end when most of the pollen has been gathered by pollinators such as bees and flies. The fertile inner surfaces of the stigma lobes then spread apart and the flower enters its “female” stage. The two long lobes now unfurl outwards, allowing the fertile inner sides of the lobes to rub against the outside of their own styles, where they come in contact with the rest of their own pollen. This allows for self-fertilization while at the same time ensuring that pollen is readily available for pollinators even in bad flying weather. Wind pollination can also occur. This is why dandelion pollen is also listed on pollen calendars as a source of hayfever.

Seeds (20 x lifesize) (Fig. C)

The inferior, cylindrical ovary consists of two fused carpels and only one ovary. The seed is an achene, i.e. a one-seeded fruit containing a single seed whose shell and pericarp (wall) are bonded (11).

As the seeds ripen, the beak (12) grows to three to four times the length of the seed, while the pappus (13) remains attached to the achene. During warm, dry weather the seeds open horizontally, forming a parachute that allows for wind dissemination, while at the same time the outer leaves bend downward. Dandelions are also called blowballs because their ripe seeds can be dislodged from their receptacle by a gust of wind or a puff of breath, which enable the seeds to travel great distances (up to 10 km). The numerous barb-like protrusions on the outer surface of the seed keep it “anchored” to the ground, thus ensuring that the seed will germinate. In addition to reproducing sexually through seed fertilization, dandelions can also propagate asexually.