

ASTERACEAE • SUNFLOWER FAMILY

A family of diverse attributes, its members range from annuals to biennials and perennials; delicate herbs to woody vines, shrubs, and trees. Leaves basal and/or on stems; alternate, opposite, or whorled; undivided to 2-pinnate. Their tiny flowers (**florets**) are densely packed into a cluster and attached to a common receptacle, a unit called a **composite flowerhead**. Though each flowerhead superficially resembles a single flower, it actually contains few-to-many florets (rarely only one). On the upper surface of the receptacle in some flowerheads, slender bracts called **paleae** individually subtend (occur below) the florets (paleae are also called pales, chaffy bracts, chaff scales, or receptacular bracts). A receptacle with paleae is described as **paleate**; a receptacle without paleae is **epaleate**. The lower outer surface of the flowerhead is surrounded by leaf-like or sepal-like overlapping bracts called **phyllaries** (or involucre bracts). Phyllaries are arranged in one or more whorls or spirals, sometimes crowded, sometimes spread out. Together, the phyllaries form the **involucre**.

Each floret contains parts of both sexes (**bisexual**), of only one sex (**staminate** [male] or **pistillate** [female]), or none (**sterile**). The **calyx** is modified into a **pappus**, which consists of one or more rings of hairlike **bristles** (sometimes with feather-like side branches), narrow to broad flat membranous **scales**, or long stiff, smooth or barbed **awns** (sometimes a mixture of bristles, scales, and/or awns); in some taxa the pappus is totally absent. Pappus units are whitish or brownish, never green or sepal-like. The **corolla** is radial or bilateral (rarely absent); lobes (o)3-5. *Stamens* (3-)5, filament bases fused to the corolla, free above, *anthers fused into a cylinder that surrounds the style*. *Ovary inferior*, pistil 1, 1-chambered; ovule 1, attached in base of ovary. *Style 2-branched near tip*; *stigmas are borne on the basal facing (inner) sides of the style branches* and generally end below the tip. Fruit a dry 1-seeded **cypsela** (think of a sunflower seed still in its case, which is the ovary), sometimes called an achene. The pappus may remain attached to the fruit or may fall off. Fruit features are usually helpful for identification.

In bisexual florets, anthers release pollen *into* the cylinder they form around the style. Pollen adheres to the outside of the style and is carried upward as the style grows through the cylinder and elongates. Pollen adheres to insects as they move among the styles in search of food. When they visit other flowers, the pollen is inadvertently transferred to stigmas of mature florets. In unfertilized florets, the style branches continue to grow and curl back, forcing contact of the stigmas with the pollen-laden style, thus effecting self-pollination.

Sunflowers display quite a number of floret types. Those most commonly encountered in our area are **disk**, **ray**, and **ligulate** florets. Other types are **filiform**, **naked**, and **bilabiate** florets. **Disk floret** – corolla radially symmetric (rarely bilateral), slender and tubular with 5 (rarely 4) small equal-sized lobes at the tip; each includes both sexes (bisexual disk floret, such as in scabrid sweetbush, *Bebbia juncea* var. *aspera*); in a few genera the pistil is nonfunctional (staminate disk floret). **Ray floret** – corolla bilaterally symmetric, a short to long tube topped on one side with a strap-like blade that is generally 3-lobed at tip (occasionally unlobed or with a different number of teeth); ray florets lack stamens; each contains a fertile pistil (pistillate ray floret) or a small infertile pistil (sterile ray floret). Common tidy-tips (*Layia platyglossa*) has both disk and ray florets. **Ligulate floret** – corolla bilaterally symmetric; a short to long tube is topped on one side with a strap-like blade that is 5-lobed at tip; ligulate florets are always bisexual (such as in wreath-plants, *Stephanomeria* spp.). **Filiform floret** – resembles a disk floret in that the corolla is radially symmetric and tubular but differs in the corolla's being cylindric, very narrow, and blunt-tipped (rarely with minute lobes); it also lacks anthers. The female (pistillate) florets of baccharis (*Baccharis* spp.) are filiform. **Naked florets** – similar to filiform florets but have no corolla. The female (pistillate) florets of bur-sages (*Ambrosia* spp.) and cockleburs (*Xanthium* spp.) are naked. **Bilabiate florets** – corolla distinctly two-lipped; one lip has two slender lobes, the other has a single broad three-lobed ray. Our only aster with bilabiate florets is sacappellote (*Acourtia microcephala*).

Floret Anatomy and Major Types

