Prickles, Thorns and Spines

Plants have evolved many ways to protect themselves from hungry animals. The use of sharp protuberances in plants gardeners love to cultivate is one such adaptation. Prickles, thorns and spines can be the bane of gardeners everywhere, especially when one is stuck in your finger. While they may look similar, each derives from a particular tissue, a characteristic that can used to key out and identify unfamiliar plants.

Thorns and spines are modifications of existing organs occurring along nodes or **stipules** (small leaf-like appendages at the base of the petiole), while prickles emerge from surface tissues in locations other than nodes. Unlike prickles, both thorns and spines contain vascular bundles, which supported some photosynthesis when the thorns and spines were immature. However, the main purpose for all three is plant protection.

Prickles are derived from epidermal or sub-epidermal tissue that can appear anywhere on a plant's stem, fruit or leaves. The beloved rose is a prime example of a well-armed plant showing a wide diversity in size, shape and arrangement of prickles. *Rosa rugosa* has small, brown and quite numerous prickles that completely cover the stems, while the Explorer series and a number of species roses have quite large, buff to reddish, wickedly sharp prickles in a relatively random arrangement down the stems. Prickles can be seen on fruit too. The spiny capsules surrounding the seeds of *Datura* and *Aesculus glabra* (Ohio buckeye) are good examples. Not to be outdone, the leaves and bracts of thistles are also well-armed with prickles. The most spectacular example occurs on the South American citrus plant, *Solanum quitoense*. Lethal purple and buff prickles, arranged along leaf veins on both upper and lower surfaces, make this a beautiful but formidable plant.

Thorns are short, hard and pointed, modified pieces of stem tissue that emerge near a leaf. They can be single or branched but are always lethally sharp. Well-hidden amongst the foliage, they are most often felt before they are seen. Some sources describe thorns as **stem spines** due to their presence along woody branches such as in *Hippophae* (sea buckthorn) or *Crataegus* (hawthorn) species.

Spines are similar to thorns but are derived from modified leaf tissue. Plant Identification Terminology by Harris and Harris[1] defines a spine as a "stiff, slender, sharp-pointed structure arising from below the epidermis, representing a modified leaf or stipule." In succulents such as in the genus *Euphorbia*, spines are located in the axil of a tiny leaflet. In cacti, spines emerge from light to dark coloured bumps called **areoles,** arranged along the surface. Our native *Opuntia* cacti highlight how 'protective' spines can be.

[1] Plant Identification and Terminology: An Illustrated Glossary. Second edition. ©2001 by James G. Harris and Melinda Woolf Harris. Spring Lake Publishing, Payson UT, USA.

Prickles on *Rosa*. Image Credit: Patricia Stooke

Thorns on *Crataegus*. Image Credit: Patricia Stooke

Spines on *Opuntia*. Image Credit: Elaine Rude