

TERMS FOR SURFACE VESTITURE AND RELIEF OF CUCURBITACEAE FRUITS

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ABSTRACT

Terminology describing fruit surfaces of Cucurbitaceae is reviewed. The terms aculeate, bristly, echinate, muricate, tuberculate, furrowed, and smooth are defined and illustrated. Hispid, hirsute, pubescent, and villous describe vestiture (trichomes); echinate, aculeate, muricate, furrowed, tuberculate, and smooth refer to features of relief (not trichomes).

KEY WORDS: Cucurbitaceae fruits, surface vestiture and relief

In preparation of the taxonomic treatment of Cucurbitaceae for the developing Flora of North America North of Mexico (FNANM) volumes, terminology for describing features of fruit surface in that family was reviewed. Supposing that others might also find it useful toward clarity and consistency, a summary is presented here. Surface feature terms are divided here somewhat arbitrarily into two categories — **vestiture** (descriptions of trichome cover) and **relief** (broadly inclusive, including all terms not directly descriptive of trichome cover). The FNA description of fruit surface for the whole family is "glabrous or with trichome cover (hispid, hirsute, pubescent, villous), smooth or with surface relief (echinate, aculeate, muricate, tuberculate, furrowed)."

In general, definitions from the FNA Glossary (Kiger & Porter 2001) are the most useful for Cucurbitaceae. For each of the terms described below, the etymological derivation is shown and an illustration is provided to show the "typical" (or "lectotypical") condition. The present review draws from glossaries from Asa Gray (1887 = "A. Gray"), Fernald (1950), Lawrence (1955), and Radford et al. (1974), the glossary prepared for FNA authors (Kiger & Porter 2001 = "FNA"), *Composition of Scientific Words* (Brown 1956), and other miscellaneous sources.

Ambiguity of interpretation exists in some cases, especially with regard to the term "echinate." When the spinelike structures of an echinate surface are very thin in diameter and trichomelike, the condition might just as well be regarded as one of vestiture — hispid or hirsute. For example, echinate fruit surfaces in *Sicyos* are covered with trichomelike structures, but these are not clearly homologous with trichomes. In fact, they themselves, individually, may have surficial trichomes or trichomelike features. Fruits of some *Sicyos* species have both spinules and trichomes.

A correlated ambiguity extends to the terms "bristles" and "bristly," which have sometimes been used at least with reference to *Sicyos* (e.g., Nesom 2011).

bristly (Anglo-Saxon, *byrst*, hair) – Beset with bristles; hirsute, hispid, setose; bristles: "stiff, sharp hairs, or any very slender bodies of similar appearance" (A. Gray); "bearing relatively long and slender, more or less straight, terete, fine-pointed stiff hairs" (FNA).

Because most definitions of bristle equate it with a hair, I have not used the term in the FNA treatment. Instead, a thin spinelike structure is referred to as a "spinule" (diminutive of spine). Because "hair" lacks the technical precision of "trichome," however, bristle and spinule might justifiably be used interchangeably.

VESTITURE Types of trichome cover.

hispid, hirsute, pubescent, villous - Standard terms defined in many botanical glossaries. See illustrations in Lawrence (1955). *Thladiantha dubia*.

RELIEF Features based on surface topology and epidermal outgrowths or excrescences (excluding trichomes).

echinate (Greek, *echinos*, sea urchin, hedgehog) Figure 1A. Bristly, prickly, spinulose; "armed with prickles (like a hedgehog)" (A. Gray); "covered with spines; spinose, spiny" (FNA). *Brandegea, Cucumis, Cyclanthera, Echinocystis, Echinopepon, Marah, Sicyos*.

aculeate (Latin, *aculeus*, sting, spur) Figure 1B. Having any sharp-pointed structure; prickly, spinose, spiny; "armed with prickles, i.e., *aculei*; as the Rose and Brier (A. Gray); "having slender, stiff, sharp projections oriented in the general plane of the structure" (FNA). *Cucumis*.

muricate/muriculate (Latin, *muricatus*, pointed or spiny like the surface of a murex shell (a kind of mollusk)) Figure 1C. "Beset with short and hard or prickly points" (A. Gray); covered with short, sharp points; "rough with short, hard points or protuberances; with short, hard, more or less acute, transversely round protrusions overall" (FNA). *Cucumis, Ecballium, Momordica*. *Ecballium elaterium* has short conical tubercles abruptly drawn out apically into a thin, hairlike extension – it seems likely that these structures are homologous with echinate spines common elsewhere in the family, but I have termed the surface as "muricate-hispid to muricate-hirsute." *Cucumis, Momordica*.

furrowed (Middle English, *fur(o)we, furgh*) Figure 2A. With furrows, "elongate depression[s] that [are] relatively shallow and narrow" (FNA). *Cucurbita*.

tuberculate (Latin, *tuberculum*, diminutive of *tuber*) Figure 2B. With small, rounded projections, swellings, or protuberances; "bearing excrescences or pimples" (A. Gray); "verrucose, warty, covered with small, relatively broad, irregularly shaped, obtuse projections" (FNA). *Cucurbita*.

smooth (Old English, *smōth*, akin to Old Saxon, *smōthi*) Figure 2C. Having a surface free from irregularities, roughness, or projections, even; "even or unrelieved overall. Strictly applied, this term refers only to the surface proper; however, it is often used to mean glabrous as well" (FNA). The smooth condition in Figure 2C at least has minimal surface relief, and it also illustrates the how the term may refer to both vestiture and relief. Species in most genera.

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Figure 1. A. Echinete surface; European hedgehog, *Erinaceus europaeus*; B. Aculeate surface; prickles of *Rosa* stem; C. Muricate surface; individuals of purple dye-murex, *Bolinus brandaris* (originally *Murex brandaris* L.)



Figure 2. A. Furrowed, vestiture of *Gossypium hirsutum*. B. Tuberculate, glabrous; a cultivar of *Cucurbita melopepo*. C. Smooth (or mostly lacking relief), glabrous (perhaps artificially).