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Ephedra coryi in central New Mexico?

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Recent botanical literature (Stevenson 1993; Gymnosperm Database 2010) and identifications on labels of several herbarium specimens (NMBCC 2007) place *Ephedra coryi* E.L Reed in the Sierra Oscura and also the San Andres and Caballo mountains in south-central New Mexico. My recent trip to the northern slope of the Sierra Oscura in southeastern Socorro County leads to me to believe that *E. coryi* is not the appropriate name for these large, shrubby plants. The plant I encountered in the Sierra Oscura (*R.C. Sivinski 7606* UNM) closely resembles one that I know fairly well from the northwestern part of the state – *Ephedra viridis* Coville.

Ephedra viridis is a vivid green to yellowish-green shrub with broom-like twigs on thick, gray, woody stems from an individual caudex that is usually not rhizomatous (Figure 1.). It has opposite, connate leaves with swollen brownish or eventually black bases, female cones with two dark brown seeds, and 4-5 pairs of scales that are green when fresh, ovate-acute, and membranous-papery only at the margins. Female cones are usually sessile or almost sessile with short, scaly peduncles less than 5 mm long.

Ephedra coryi and *E. viridis* have many similar characteristics, but *E. coryi* usually has female cones with longer peduncles, a very different rhizomatous growth form, and the populations closest to New Mexico grow on sand dunes in the shinnery oak region of west Texas. McLean (1950) and Correll and Johnston (1970) reported *E. coryi* from southeastern New Mexico without specimen citation, but probably from Lea or Eddy counties. The populations on loose sand have extensive, long rhizomes, which sprout clumps of slender, green, above-ground twigs about 2-5 dm tall. Above-ground woody stems, if present, have reddish brown bark and can occasionally extend the plant height to 1 m tall (Reed 1936, Cutler 1939, Vines 1960, Correll and Johnston 1970). In addition to the rhizomatous sand dune form, Powell (1997) is alone in saying *E. coryi* also occurs "in the rocky hills of the Edwards Plateau" where it would likely not have the rhizomes that occur in looser soils. However, the most recent assessment of the Texas distribution of *E. coryi* by Carr (2005) confines it to "dune areas and dry grasslands in the southern plains country" where the populations are rhizomatous.

The unusual plants on the rocky limestone slopes of the Sierra Oscura and San Andres Mountains in New Mexico have apparently been called *E. coryi* by Stevenson (1993) because the females consistently have short (5-10 mm) peduncles and twigs with slightly scabrous ridges (Figures 2 and 3). However, all the *E. viridis* specimens at UNM Herbarium have slightly scabrous twigs and some have unusually long female cone peduncles. For instance, a population of *E. viridis* on the dry, calcareous soils around Tunnel Spring at the north foot of the Sandia Mountains in Sandoval County has only a few female individuals with short (3 mm) peduncles (*R.C. Sivinski 5714* UNM). Most of the females in this population have mature peduncles of 5-10 mm in length (rarely up to 21 mm or on long cone stalks with multiple joints) (*R.C. Sivinski 7610* UNM). In addition to the Sierra Oscura and San Andres Mountains populations, there are several sterile UNM specimens of *viridis*-like plants from central New Mexico in the Jemez, Ladron, and Sacramento mountains, Chupadera Mesa, and Carrizozo Malpais that should be checked in late May or early June for prominent female cone peduncles. I have also encountered this plant on limestone (in sterile condition) closer to the Rio Grande on the Loma de las Canas ridgeline along Quebradas Road in Socorro County. These central New Mexico populations

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Botanice est Scientia Naturalis quae Vegetabilium cognitiorem tradit.
— Linnaeus

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have a *viridis*-like growth form of large, 5-15 dm tall, solitary shrubs with thick woody branches bearing gray bark – just like the plants in the Sierra Oscura.

Another taxonomic problem with this species group occurs in the Four-Corners Region where *Ephedra cutleri* Peebles is also separated from *E. viridis* by it rhizomatous growth on sand dunes and longer female cone peduncles – in addition to viscid twigs. These distinguishing features, however, are sometimes inconstant and occasionally produce intermediate or incomplete character states that are difficult to name. Welsh et al. (2003) continued to use the infraspecific name *E. viridis* var. *viscida* (Cutler) L. Benson, instead of the species *E. cutleri*, because "the length of the stalks of the ovulate cones and the viscid condition of the stems forms a continuum with *E viridis* in a strict sense, especially where the two grow together". A New Mexico example is the specimen *W.L. Wagner 2973* UNM from shallow soil on a sandstone mesa in McKinley County. It has gray bark, non-viscid twigs, and female cone peduncles from 10-22 mm long on a single branch, which is similar to the unusual shrubby green ephedras in central New Mexico.

In summary, the solitary, large, woody ephedras with gray bark and bright green twigs in central New Mexico are taxonomically discordant in *E. coryi*. If the extensively rhizomatous *E. coryi* were in southeastern Socorro County, it would likely be occupying the vast sand dunes just west of Bingham instead of growing with aerial woody branches on the rocky slopes of the Sierra Oscura just two miles east of those dunes. These rocky hill populations have been placed in *E. coryi* only because no other regional name is available for an ephedra with prominent female cone peduncles and non-viscid twigs. Although a poor fit for *E. viridis*, in overall form and habitat they more closely resemble that species and that is the name I will call them until a more suitable taxon is published. Otherwise, the mostly rhizomatous ephedras with viscid twigs on Colorado Plateau sand dunes can be placed in *E. cutleri* and the low, rhizomatous plants with non-viscid twigs and prominent female cone peduncles on the dunes and plains of west Texas are *E. coryi*. New Mexican botanists should make an effort to relocate the real *E. coryi* on dune habitats in the southeastern corner of the state.

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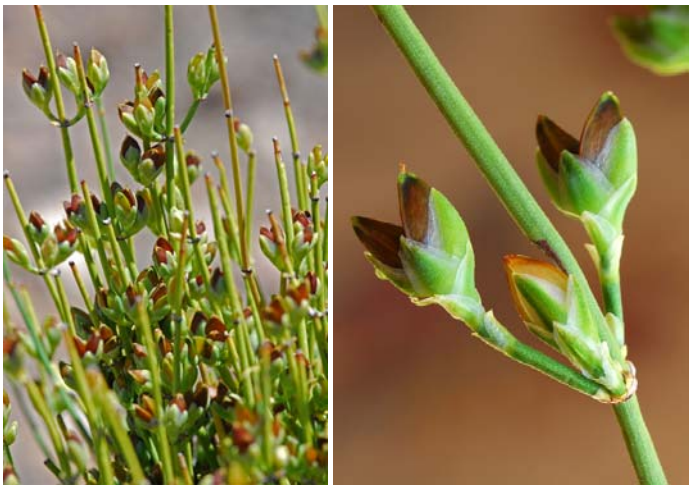
Figure 1. *Ephedra viridis* in the Sierra Oscura, Socorro County, New Mexico.



Figures 2 and 3. Prominent female cone peduncles on *Ephedra viridis* in the Sierra Oscura of New Mexico (*R.C. Sivinski 7606* UNM). ☺

My Point of View

In 1751, Carolus Linnaeus[1] first published *Philosophia Botanica* (The Science of Botany), an amplification of his earlier and much shorter *Fundamenta Botanica* (The Foundations of Botany) of 1736. Both works consisted of his declaration of 365 aphorisms or dicta (one for each day of the year) concerning all aspects of botanical science as then practiced by Linnaeus and his followers. The *Philosophia* defined and illustrated terminology, explained methodology and practice for describing plants, and dictated the rules for naming genera and species. It was, in essence, the first textbook of systematic botany. The Table of Contents only whets the appetite: The Library, Systems, Plants, The Fruit-Body, Sex, Characters, Names, Definitions, Varieties, Synonyms, Sketches, and Potencies.

The Philosophia makes for fascinating reading, even today, and I share some snippets [with my few comments in brackets][2]:

"The true botanists have a real basic understanding of botany, and should know how to name all vegetables with intelligible names; they are either collectors or methodizers.
"The compilers of floras list the vegetables that grow naturally in any particular place. The list should be systematic, so that notice is taken even of those that are absent; those that are present should be recorded with the location, the quality of the soil, the time, and the vernacular names.
"To the orthodox systematists we owe the clarity and accuracy of botanical science. [Amen!]
"The fragments [sections or classes] of the natural method are to be sought out studiously. This is the beginning and the end of what is needed in botany. Nature does not make leaps. All plants exhibit their contiguities on either side, like territories on a geographical map.
"The vegetables comprise seven families: funguses, algae, mosses, ferns, grasses, palms, and plants.
"The foundation of botany is two-fold, arrangement and nomenclature. The knowledge of botany bears on these hinges; thus all plants become known in a single year, at first sight, with no instructor and without pictures or descriptions, by means of stable recollection. Therefore anyone who knows this is a botanist, and no one else is.
"If you do not know the names of things, the knowledge of them perishes.
"Only genuine botanists have the ability to apply names to plants. [That is, those with the ability to apply the names are the genuine botanists.]
"The endings and pronunciation of generic names should be made easy, as far as possible. Generic names 1½ feet long, those that are difficult to pronounce, or are disgusting, should be avoided.
"A specific name without a generic one is like a bell without a clapper."

He even gives the planting order for a floral clock, whose plants will flower from 3 am (*Tragopogon luteum*) to 8 pm (*Hemerocallis fulva*).

Some of the most instructive notes are to be found in the end-section, entitled Memoranda, which was added so that there would be no blank pages in his book. Here we find directives and counsel for the beginning botanist, for establishing an herbarium, and for botanizing, where he advises on clothing, instruments, rules for those who come late, the route, what to gather, and how to give a botanical demonstration along the way.

For my purposes, I wish to call attention to two of Linnaeus's instructions in *Philosophia Botanica*, from which some of us might obtain valuable counsel:

"Anyone who comes upon a new species should give it a specific name, provided that such a name is needed.
"The true botanist applies himself to removing plants of no fixed abode to genera."

Here Linnaeus is saying, "If you find a plant new to science, give it a name!"

I am continually surprised and distraught to learn of botanists (so-called) who discover a new species, and who do nothing about it. As one heavily involved in compiling, arranging, and explaining the plants of New Mexico, I (and many others in the same pursuit)

(*Continued on page 4, Point of View*)

Botany is the natural science that transmits the knowledge of plants.

— Linnaeus

(*Point of View, continued from page 3*)
rely on current and accurate accounts of our natural flora. This is what a "true botanist" does, according to Linnaeus, and he[3] does it quickly and in a scholarly manner.

Therefore, in the spirit of Linnaeus's dicta in *Philosophia Botanica*, I offer the following:

1. New species should be named quickly after they are discovered. "Quickly" might be hard to define, but, like something else, we know it when we see it. Any time longer than five years is certainly not quickly, and the line might reasonably be moved to three years, or even two.
2. Priority of doing the naming goes first to the discoverer, second to those he asks to assist, and third to any others.
3. The priority described in Rule Number 2 is rendered of no affect if Rule Number 1 is violated. At this point, anyone can enter the name game.
4. There are no proprietary rights associated with being an "expert" in one particular plant group or another, of being a professional rather than an amateur, or of being at some institution or another: there simply is no "turf." Anyone can name a plant from any group, so long as they familiarize themselves with and follow the rules of nomenclature.
5. Appropriate acknowledgement may be given to lazy or sluggish discoverers of new species who fail to act. They may be acknowledged (honored is too strong) by use of the *ex* in the authorities following the binomial. For example, if Mr. Jones discovers a new species in an herbarium, and writes upon the sheet a tentative name (such as *Aristida tardissima* n.sp.), but never does anything about it, even after repeated attempts to cajole or inveigle him to action, then a later Mr. Smith could appropriately name the species: *Aristida tardissima* Jones ex Smith[4].

I end with another of Linnaeus's aphorisms:

"The true botanist advances the science of botany everywhere. The crude showman contributes nothing to the growth of science."

— Kelly W. Allred

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[1]Linnaeus's proper name was Carl Linnaeus, his father (Nils) having invented the surname when he matriculated at the University of Lund. His made-up name was an allusion to a large and ancient linden tree, "linn" in the local dialect, that grew on their family property, known as Linnegard. Other branches of the family took the name *Lindelius* and *Tiliander* from the same famous tree. The name Linnaeus was thus in Latin form from the beginning. Carolus Linnaeus was enobled in 1761, and took the name Carl von Linné immediately following in 1762. I use here Carolus Linnaeus, as that is how he referred to himself as author in all of his works. [see "*The Linnaean correspondence*, an electronic edition prepared by the Swedish Linnaeus Society, Uppsala, and published by the Centre international d'étude du XVIII^{e} siècle, Ferney-Voltaire," accessed 27 August 2010 at http://linnaeus.c18.net/Doc/lbio.php.]

[2]I am indebted to the wonderful translation to English of *Philosophia Botanica* by Stephen Freer, Oxford University Press, paperback edition of 2005.

[3]I use here, without prejudice, malice, or insensitivity, the classical and conservative generic masculine pronoun to refer to all persons, whether male or female.

[4]Even better, the species could be named *for* the procrastinating Mr. Jones: *Aristida desidiosa*. ☺

Plant Distribution Reports

New records and significant distribution reports for New Mexico plants should be documented by complete collection information and disposition of a specimen (herbarium). Exotic taxa are indicated by an asterisk (*), endemic taxa by a cross (+). Comments [in brackets] are the editor's.

— Chick Keller [4470 Ridgeway, Los Alamos, NM 87544]

Carex luzulina Olney var ***ablata*** (L.H. Bailey) F.J. Hermann (Cyperaceae, woodrush sedge): Rio Arriba County: San Juan Mountains, southeast of Chama and just south of and adjoining the Chama Land & Cattle Company, N36°49'54" W106° 27' 05", wet meadow with *Packera crocata*, *Pedicularis groenlandica*, *Ranunculus alismifolia*, 9800 ft, 1 July 2010, Chick Keller s.n. (UNM). [This is the first report of this species for NM.]

— Nesom, 2010 [see Botanical Literature of Interest]

Verbena livermorensis Nesom (Verbenaceae, Big Bend vervain): Lincoln and Otero counties.

Fraxinus cuspidata Torrey var. ***macropetala*** (Eastwood) Rehder (Oleaceae): Doña Ana, Hidalgo, McKinley, and Valencia counties. ☺

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Kelly Allred, editor

Botanical Literature of Interest

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