

## Synoptic Key to North American Morels

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Instructions: on a separate sheet, make a list of possible species based on the most reliably known feature (use numbers). For example, if you have a mature mushroom, the cap ridge colour would be reliable; if only immature mushrooms are present, it would not be. Use a process of elimination based on other features to determine which species are possible. Note that not all species can be distinguished macroscopically, and some may even require genetic testing. Other species are known from North America based on genetic testing but have not yet been described.

<i>Morchella</i> sp.	Habitat <sup>1</sup>	Ridge Colour <sup>2</sup>	Range <sup>3</sup>	Cap Attachment <sup>4</sup>	Cap & Stem <sup>5</sup>	Other Key Features <sup>6</sup>
1. <i>americana</i> ( <i>esculentoides</i> )	D & C (Ap, As, Bo, El, Fi, Ma, Oa, Pi, Po, Pr, Sp)	Y	T	A	V, I, C?, R?	Pits and ridges somewhat regularly shaped, with ridges becoming thin and sharp at maturity, head typically egg-shaped to cylindrical, common across North America
2. <i>angusticeps</i>	D (As, Tu)	B	E	G2-5	V, R?	5-14+ cm tall, spores 22-27 u long
3. <i>brunnea</i>	D (Ar, Oa), C?	B	W	G2-3	V	Ridges dark when young
4. <i>diminutiva</i>	D (As, Hi, Tu, others)	Y	E	A	V, S	Typically only 3-9 cm tall, cap usually pointed
5. <i>eximia</i> ( <i>septimelata</i> )	F	B	T	G1-3	V	ES subclavate to clavate
6. <i>exuberans</i> ( <i>capitata</i> )	F	B	T	G1-7	C, R?	ES capitate
7. <i>importuna</i>	L	B	T	G2-5	V, S, R?	Horizontal ridges typically numerous and at varying depths
8. <i>populiphila</i>	D (Po)	B	W	H	V	Under <i>P. trichocarpa</i> near rivers, ES 100-175 x 10-25 um
9. <i>prava</i>	D, C	Y	C	A	I, R?	Pits and ridges contorted; ridges remain wide at maturity, head widely egg-shaped, often in sandy soil near lakes & rivers, uncommon
10. <i>punctipes</i>	D (As, El, Tu, others)	B	E	H	V	ES 50-100 x 10-25 um
11. <i>rufobrunnea</i>	L	R	T	A	V, R?	Pits dark relative to ridges
12. <i>scepriiformis</i> ( <i>viginiana</i> )	D (Tu)	Y	E	A	V	Cap usually egg-shaped
13. <i>septentrionalis</i>	D (As, Po)	B	E	G2-3	V, R?	4-7 cm tall, spores 20-22 um long
14. <i>sextelata</i>	F	B	W	G1-3	V	ES more rounded; identical to <i>eximia</i>
15. <i>snyderi</i>	C (Do, Fi, Pi)	B (Y)	W	G2-4	R, V	Ridges pale when young but darken at maturity
16. <i>tomentosa</i>	F	B	W	A	T, V	Projecting hairs 120-250+ um
17. <i>tridentina</i> ( <i>frustrata</i> )	D & C (Ar, Do, Fi, Oa, Pi)	B & Y	T	G2-4	V	Cap ridges don't darken at maturity
18. <i>ulmaria</i> ( <i>cryptica</i> )	D (As, El, Ma, Tu)	Y	E	A	V, I	Like <i>americana</i> but only in Great Lakes region

<sup>1</sup>F=Conifer forests within 1-2+ years after fire, C=Conifer forests, D=Broadleaf (deciduous) forests, L=Landscaped settings (usually wood chips); Ap=Apple (*Malus*), As=Ash (*Fraxinus*), Ar=Arbutus (*Arbutus*), Bo=Boxwood (*Buxus*), Do=Douglas-fir (*Pseudotsuga*), El=Elm (*Ulmus*), Fi=Fir (*Abies*), Hi=Hickory (*Carya*), Ma=Maple (*Acer*), Oa=Oak (*Quercus*), Pi=Pine (*Pinus*) Po=Poplar/aspens (*Populus*), Pr=Prickly Ash (*Zanthoxylum*), Sp=Spruce (*Abies*), Tu=Tulip tree (*Liriodendron tulipifera*). Lists are not exhaustive.

<sup>2</sup>Colour of **mature** cap's ridges; B=Black/very dark, Y=Yellow or other light colour, R=Light & bruising reddish

<sup>3</sup>W=Western, E=Eastern, N=Across North America, T=Transcontinental. Note that this is typically interpreted relative to the Rocky Mountains, however it would not be unexpected to find either in Alberta

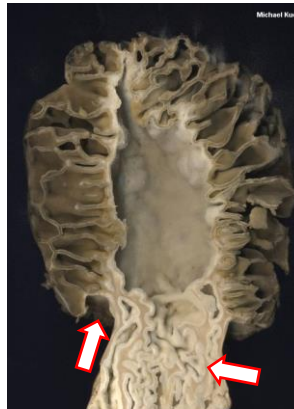
<sup>4</sup>A=Cap adnate to stem (no groove or indentation), G=Groove between cap and stem (numbers are length & width of groove in mm, e.g. G2-4 has a groove 2-4 mm deep & wide), H=Cap attached to the stem only about halfway up, with a significant portion hanging free ("half-free")

<sup>5</sup>C= Stem chambered & layered internally at least near base, I=Irregular/rounded pits, R =Stem very ridged & pocketed, especially on upper half, S= Vertical ridges of pits high and in relatively straight lines & few horizontal ridges connect at the same height as vertical ones, T=Cap surface densely velvety at least when young, V=Pits primarily elongated vertically \*Note that a "?" means that a feature is variable and so may or may not be present

<sup>6</sup>ES=Elements on sterile ridges (microscopic)



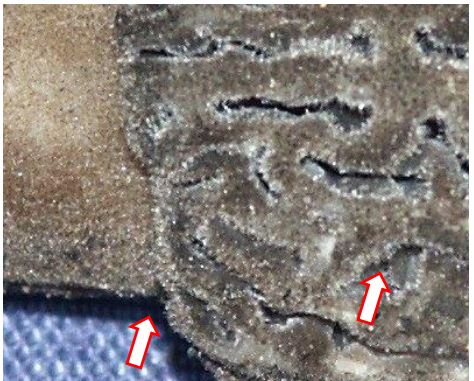
Prominently ridged stem of *M. snyderi* = "R"



Chambered stem in *M. exuberans* = "C". Also note groove ("G") between cap & stem



High vertical and lower horizontal ridges of *M. importuna* = "S"



Densely velvety cap of *M. tomentosa* = "T". Also note adnate cap, attached completely to stalk = "A"



Irregularly shaped pits of *M. prava* = "I"



"Half-free" cap of *M. populiphila* = "H"



Vertically elongated pits of *M. rufobrunnea* = "V". Also note light ridges & dark pits in this species.

Photos from [www.mushroomexpert.com](http://www.mushroomexpert.com). Please also note that a dichotomous key, complete descriptions, and additional photos can also be found on this site.

Taxonomy based on F. Richard, J. Bellanger, P. Clowez, K. Hansen, K. O'Donnell, A. Urban, M. Sauve, R. Courtecuisse & P. Moreau. 2017. True morels (*Morchella*, Pezizales) of Europe and North America: evolutionary relationships inferred from multilocus data and a unified taxonomy, *Mycologia*, 107:2, 359-382.