**Topic 01: Biotic inventory and related activities.**

**Topic 01, Exercise 01: 17 Jan 2006**

One of the most important activities systematists do is conduct biotic inventories. We will conduct a biotic inventory of the genera of conifers on campus. Since we are not yet experts in identification, we will use a traditional dichotomous key to identify the genera of conifers that we have on campus (next page). Once we have this inventory, we will prepare an interactive key that will be posted online (at the Herbarium website) and will be used by future classes and other botanical enthusiasts of the MU Community.

Procedure for today and as homework:

1. Collect conifers around campus.
2. Key them out to genus.
3. Construct a working checklist of the genera on MU campus.
4. Enter these alphabetically into the rows of datamatrix or spreadsheet.
5. Make a master list of the structural characteristics by which they differ.
6. Sort and name these characteristics (and their states) logically.
7. Enter these “characters” and “character states” logically as column headers in your datamatrix or spreadsheet.
8. Score these species for the appropriate character states. Use your specimens and literature to complete this.
A. Plants not evergreen
    B. Branchlets short and stubby, persistent, alternate......................................\textit{Larix, Larch}
    BB. Branchlets elongate, deciduous, opposite...........................................\textit{Metasequoia, Dawn Redwood}

AA. Plants evergreen
    C. Leaves needle-shaped or otherwise elongate and well-diverging from the stem
        D. Leaves in fascicles of 2, 3, or 5.......................................................\textit{Pinus, Pine}
        DD. Leaves borne singly or tufted on stubby side-branches (but not fascicled)
            E. Leaves tufted on stubby side-branches.......................... . \textit{Cedrus, Cedar}
        EE. Leaves borne singly
            F. Leaf ending at stem so that stem is woody in texture & color.
            G. Leaves sharp-pointed and square in cross-section, with small woody peg-like leaf-stalk.......................\textit{Picea, Spruce}
            GG. Leaves round-pointed and flattened, woody peg-like leaf-stalk absent or if present not very prominent
                H. Leaves usually <1.5 cm long, with distinct leaf-stalk; cones 1-2 cm long ...........\textit{Tsuga, Hemlock}
                HH. Leaves >1.5 cm long, with no distinct leaf-stalk (although perhaps with a gradually narrowed leaf-base); cones >2.5 cm long
                    I. Cones erect with scales deciduous at maturity; needle-base swollen and round, leaving a round leaf-scar..............\textit{Abies, Fir}
                    II. Cones pendulous, scales persistent, with very long 3-lobed bracts that look like the rear-end of a mouse; needle-base not swollen, leaf-scar either not round or not very big..............\textit{Pseudotsuga, Douglas Fir}
            FF. Leaf-base decurrent along (i.e., the base runs along) the stem for some distance, such that twig stem to which leaves are attached appears green.
                J. Leaves flattened and round pointed; cones with just a single seed which is partially enclosed in fleshy red aril; often bushes or shrubs..............................\textit{Taxus, Yew}
                JJ. Leaves angular (not flattened) in cross-section and pointy; cones without fleshy red aril, more than one seed
                    K. Cones round and >1 cm diameter, dry and brown at maturity; leaves silvery green; trees
                        ................\textit{Cryptomeria, Japanese Cedar}
                        K. Cones soft and berry-like; both needle leaves (juvenile) and scale leaves (adult) usu. present; trees or shrubs...\textit{Juniperus, Juniper}
                CC. Leaves scale-like (or at least not especially elongate)
                    K. Branchlets forming flattened fan-like sprays
                        L. Twiglets much flattened, aromatic; cones elongate; cone-scales flattened, 8-12 .......................................................\textit{Thuja, Arbor Vitae}
LL. Twiglets rounder, not so aromatic; cones round; cone-scales shield-shaped, 4-8...........................................................\textit{Chamaecyparis, Cypress}

KK. Branchlets forming 3-D clusters not at all fan-like
M. Cones soft and berry-like, needle leaves (juvenile) and scale leaves (adult) often mixed.......................................................\textit{Juniperus, Juniper}

MM. Cones woody, leaves all more or less alike
N. Leaves uniformly scale-like and <5 mm......\textit{Cupressus, Cypress}
NN. Leaves longer than 5 mm, pointy.

.........\textit{Cryptomeria, Japanese Cedar}
Illustrated glossary for help with conifer key.