Part 3: A good bonsai matrix/soil

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There are many types of soil particles which can make up a good bonsai soil or, if you will, a bonsai soil matrix. Always if you remember the primary characteristic of the soils and particles, you can create your own bonsai soil matrix out of many different particles. Just remember the soil characteristic which will provide the plants' needs.

It must:

- Have the right pH, or acidity level.
- Not break down into mud nor lose its discrete particulate characteristics
- Have the right particulate size that, by inference, will result in the right air pore space sizes between the particles.
- And even better, if we can increase the air in the mix by having the particles themselves filled with minute pore spaces, we will even further increase the air pores.

Think of a mix of particles with the consistency of miniature Swiss chees pieces. These particles' air spaces will be so fine they will likely not allow the water to drain out from them but they will increase the amount of water in the mix without reducing the amount of air in the mix. This too clearly, is a good beneficial characteristic for we will then have an additional level of safety before any drying out can damage the roots. These are the most important considerations of the soil particles. The shape of the particles can be important but not as important as many think. Perfectly round particles will hold about as much air in between them as very angular irregular particles and sometimes more if the angularity causes the particles to pack together better when the soil is being settled around the roots. However, the irregularity can be made to work to our advantage if we choose the right amount of irregularity of the particles. We can, with these considerations in mind, create a mix with a large amount of air in the mix, and, at the same time, hold plenty of water too.

Almost all bonsai mixes include clay; clay backed to a high enough temperature that they are "calcined", that is, turned into a material that can't turn back into mud. We can, of course, bake it to a high enough temperature that it will never turn back into mud at all; in other words, baked into a rock, or "vitrified" but it will not hold any water at all. We must find a high enough level of baking that the clay will stay primarily hard, but not so hard it won't hold water – and last a few years in that condition. Of the processed clays available that have been baked, there are some best known brands. You may know them as "kitty litter" (which hasn't been baked to any degree), and the calcined clays: Turface®, Terragreen® (and their best, highest baked variety, "soil conditioner red"). You can always test the degree of baking by putting some of the clay in a cup of water. If it begins to decay, it hasn't been fired high enough. You generally can tell the degree of baking by the color, even without testing, of the finished product: the darker and redder the color, the higher the bake.

There are many other products which result in the same or similar beneficial processes.
Some diatomaceous earth clays are baked high enough to retain their shape. One sold in the UK is Tesco® which gives favorable results. Another relatively inexpensive product is Haydite®, an expanded gray shale (if you don't mind the color). Then a relatively new product on the market is Growstone®, made of expanded glass. This works well for a while, but like some others it abrades and, as their own website explains, eventually turns back into sand. Growstone® sys their product holds more water than perlite, which is extremely expanded rock, but this is not exactly so. It is correct for regular sized perlite but not the larger coarser sized perlite that has fewer fines and holds much more water and/or air than Growstone®.

Another product I used which was wonderful and held together without decomposing was totally decomposed muck peat from the Florida swamps. Totally dried to a rock-hard consistency it would last for a couple of years before needing to be replaced and had all of the water holding capacity of the Japanese akadama and kanuma tsuchi soils. These have different characteristics, but always the primary needs are for air and water holding. It was, like the Japanese soils dug out of Japanese backyards, also cheap and readily available. Not anymore in most places, and there are good or better components anyway.

The last component that needs mentioning is bark. The best kind of organic material is pine bark – and there are many kinds of bark as well. Most are too resinous. The least resinous are the Florida pines, especially the slash pine, not the longleaf pine. No other bark has the capacity to remain in granular form and not break down right away and is not too resinous. Here's another note of caution: don't use composted pine bark. If you do, you'll use something that all the value the critical mycorrhiza loving microorganisms will have ingested. Raw bark is necessary.

Don't use peat moss, any peat moss, period.
Remember what we said earlier in this series: all particles in the soil should be the same size, approximately. Again, the mind experiment that can prove it is to consider a container whose mix is of all same sized large particles. When you then add much smaller particles many of the new particles, peat for example, will fill in the large original air pockets and, to a certain degree, no additional volume of soil will result. What will happen is that air pores will be taken up, resulting in reduced air in the mix. The fact is, and it can't be overemphasized, that all the soil particles should be sieved to about the same size that will result in the maximum amount of air in the mix.

There are, of course, soil particles with the particular characteristics, as for example, crushed oyster shell, which will reduce the acidity in the soil which is occasionally necessary, as with buttonwoods. Many other specialty particles can be used for particular purposes, but these are the primary mixes we use. It would be impossible to list all the many other soils we use for specific but only occasional purposes.

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