

TARAXACUM OFFICINALE: A SURVIVOR

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There is a battle being fought. A battle in which neither side gives any quarter. A battle between two species. Homo sapiens ssp hortulanus (gardening man) and Taraxacum officinale (common dandelion).

Both species have adaptations which give them advantage in this battle for specific supremacy, but we will deal only with the adaptations of Taraxacum officinale.

That venerable vendor of vocabulary, the Oxford dictionary, defines adaptation as "the process by which an organism or species becomes adjusted to it's environment".

Venerable the Oxford may be, but it is not entirely correct. The more correct biological definition avoids all reference to adjustment by the individual. An individual cannot adapt, it can only acclimatise itself to an environment. Only a species may adapt.

Hence an adaptation is any structure process or response that suits the species (and the individuals thereof) to their environment. Therefore, we should first look at the environment of the dandelion.

In order to investigate the density of the dandelion in various environments, an area of each environment was chosen, then sampled randomly. The environments studied were:

1. Mown lawn - light to medium trampling, mown regularly, undisturbed over several years.
2. Playing field - heavy trampling, mown regularly, undisturbed over several years.
3. Fallow land - light trampling, not mown, cultivated at least yearly.
4. Wasteland - light trampling, not mown, undisturbed over several years.

By counting the number of specimens in randomly placed

quadrats the following counts expressed as number per square metre were obtained: 1. 15; 2. 20; 3. 64; 4. very few.

The figures reveal that in those areas where man has put the greatest effort, T. officinale survives the best and we will concentrate on the features which suit the dandelion to these environments.

Now that we have confined the battle ground to the areas in which the combatants function best, the battle will be all the more fierce.

Gardening man, the most fanatical of all the subspecies of man, (worse, even, than philatelic man) is playing on his home ground, and T. officinale is in it's own ideal environment. It's going to be quite a battle.

The first thing any soldier is given is a lecture, often boringly entitled "know your enemy". Here it comes.

Taraxacum officinale belongs to the Plant Kingdom and is of the Division Tracheophyta. It is of the class Angiospermae - a flowering plant and this indirectly explains the feature by which most people know the dandelion. The seed head or "fairy".

The dandelion is of the family Compositae, and this gives rise to the characteristic form of the flowers. The flowers of the dandelion, and in fact the majority of the members of Compositae are made up of large numbers (up to 300 in the dandelion) of florets; miniature, complete flowers. This conglomeration of florets is called the inflorescence and the large number of florets contained therein gives the dandelion an extremely useful adaptative advantage in it's fight against the most vicious gardening man. As each floret matures directly into a seed the large number of florets implies that there will be a large number of seeds, and hence, a large number of new individuals. As you can see this is of no advantage to individual dandelions, but to the species as a whole it is a great advantage. It increases the number of glorious dandelions ten-twentyfold, out-reproducing, out-numbering gardening man

on every front, the dandelion is victorious, long live
sorry. (See diagrams p.23).

If you will allow me some innocent anthropomorphisms I shall endeavour to explain why the dandelion should not be recognised by this single stereotyped feature.

The dandelions, being a successful species, have unfortunately, let their success go to their "head". But they feel that it is not the eminently "poofable" seedhead which is responsible for their success. They feel they have a legion of other adaptations, far more praiseworthy than this superficial piece of fluff. Perhaps they are right. What about the plant itself? Those low lying leaves that seem to cower submissively, flattening themselves against the ground. An illusion, mere illusion.

This low profile is not a sign of defeat but is in fact a cunning (if you will pardon the unscientific adjective) adaptation that protects individual dandelions from damage, and hence protects the species.

You see, in the two environments we have been looking at, the disturbed area, and the playing field, the dandelion has two main enemies. Man and his minions. It is on the playing field that this low profile comes into it's own.

Man charges about squashing and crushing poor plants, wounding defenceless vegetation, stomping, grinding.... it's too horrible, I can't go on.

Suffice to say that man, and his minions (the mower, the herbivore, and man's progeny) charge about inflicting hideous damage on the poor plants below. Except the dandelion - the plant gardening man would like to harm most.

With it's low profile the dandelion avoids damage by the blades of the mower, the teeth of the sheep, and the feet of the children.

After all, one can't call a stem length of, on average, 3mm, sticking your neck out, can one?

So far we have only looked at the structure, the

morphology of the dandelion, we have been getting to know the enemy as it were, but don't get the idea that these are the only morphological adaptations of the dandelion - oh no, there are many more.

The dandelion has modified leaves, called bracts, which protect the developing flower (and seed heads.) The shape of the leaf arrangement, known as a rosette is such that it has a maximum area for light and water collection, as well as shading other plants that have the common insolence to grow in the presence of a dandelion.

The dandelion has a tap root, long and strong, to reach down, a questing tendril in search of the last sparkle of moisture in the drought dried soil.

But the root, which so neatly closes this exciting episode on morphological adaptations also opens the next chapter, physiological adaptations, adaptations of function. (What a coincidence).

Perhaps the most important adaptation of Taraxacum officinale to suit it to the disturbed environment (and who else would disturb it, but a criminally insane gardening man) is it's ability to regenerate from a damaged root, often up to seven or eight plants off the single severed root.

Consider: A fine specimen of gardening man, in his garden, gardening (my, my). Armed to the teeth, razor-sharp weapons glowing in the dew-silvered sun. His hoe swings in vicious, plant-rending strokes. It slices cruelly through a helpless dandelion. "Got him" he says, and giggles maniacally. But not satisfied he chops again, and again, the root quivering under each blow.

But what does a worm's eye view reveal.

The wounded root sections are leaking not blood, but latex a milky white liquid which hardens on contact with air. Once hardened it protects the horribly wounded root from disease. Now the fun starts. Each fragment, upright or inverted, distal or proximal, small or large, starts to

regenerate, each producing a new plant. Victory for T. officinale. Victory.

Another physiological adaptation which inhibits mastication by those moronic minions of man, sheep, is a bitter tasting substance found in the epidermis of the root, a substance which reacts with Dragendorff's reagent - an alkaloid, a bitter substance which proves unpalatable to most herbivores. Man's cruel schemes defeated once again.

Behaviour in dandelions does not have the same connotations as it does with humans (although the more radical dandelions have been known to throw wild indole acetic acid (growth hormone) parties, this, however, is rather uncommon). Behaviour, in reference to the dandelion can be thought of as reaction to stimuli.

The main stimulus that the dandelion reacts to is light. Gardening man thinks "Ah, ha, I'll shade the wee devils, I will, I will", and so he does, depriving them of sustaining light in an act of unprovoked cruelty. (After all, how many dandelions cut off a man's food supply?)

But the dandelions are too smart. They react instantly, or within a few weeks. Their leaves rise, reaching out to grasp the last rays of a dwindling light source. Game set and match to Taraxacum officinale.

So we now have a good, well rounded, unprejudiced, unbiased, two sided overview of the battle, and an idea of the atrocities which man commits against T. officinale.

We see that gardening man is baulked at every move by the stunning brilliance and multiplicity of the dandelions adaptations.

LONG LIVE TARAXACUM OFFICINALE: THE SURVIVOR.