Nigel Venters' method for preparing pupae for emergence

I have tried hard over the years to reduce cripples on emergence, and have generally just given "Nature" and natural conditions some thought when doing this.

So depending on the species, I react differently, when placing the pupae ready for emergence. I guess one point is, that we all work hard and spend time producing our pupae. Lots of care, and of course much host-plant used, and it is up to us not to waste this time and effort.

In a perfect situation, I never try and touch any of my livestock, and prefer to create conditions where I allow the pupae to emerge naturally in the place they originally pupated.

But as a breeder, I realize of course, that we can't always do this, and most often, we need to move pupae into positions for emergence as we see fit.

So going back to natural conditions, I gave all this some fairly deep thought! I came up with a general guide which has really helped me over the years, and I post this below.

1. There is no doubt in my mind that the durability of pupae and their tolerance to handling often depends on if the pupa is a butterfly species, which either overwinters as a pupae, or is expecting to emerge in a few weeks after forming within the season, and these species never overwinter as a pupa.

2. In a way, this makes sense, why produce an unnecessary hard/durable pupa if you are going to emerge within a few weeks of forming? On the other hand, it is important, that pupae that overwinter need to have a thicker, harder shell.

3. It is interesting that some species, such as Swallowtails, which often have either an overwintering phase or aestivation as a pupae, produce a strong pupal shell, regardless of if they are going to emerge the same year, or overwinter!

4. The next point is, do the pupae hang from their tails, or produce a silk girdle and pupate in an upright position?

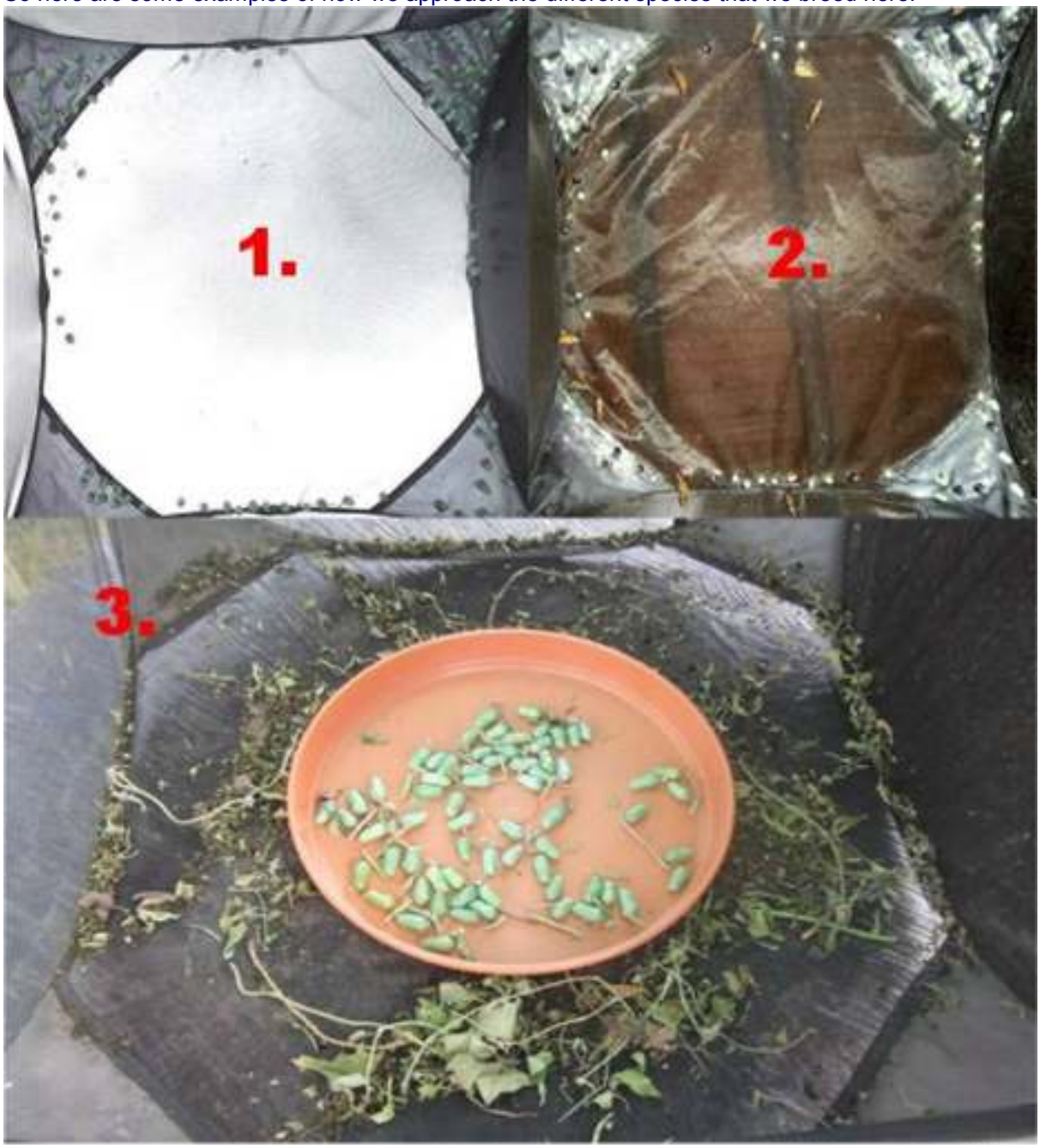
5. There is no doubt in my mind, that those species that hang from their tails, emerge far better, if unimpeded by being stuck to a vertical surface. A horizontal position, always improves emergence.

6. For those species that produce a silk "girdle" such as the Swallowtails, I use a different approach. For these, even though I have cut their silk girdle, I like to mount them in the same position for emergence. My thinking here is that they are expecting to emerge and find a grip for their, (long legs) and help pull themselves out of their pupae.

OK, here's a few photos that show what I do to emerge my butterflies. But do remember, that I do the best I can, and in no-way would say that I have got this 100% right, and many other options may work for you too! I guess I just developed my approach to emerging pupae after many, many years of observation, experiments and trials, and this system works well for me!

For those species that hang from their tails as a pupa.
Off the top of my head, I can't think of a single species of butterfly, which hangs by its tail, and also overwinters! These will always emerge within a few weeks of the pupae being formed.

So here are some examples of how we approach the different species that we breed here.

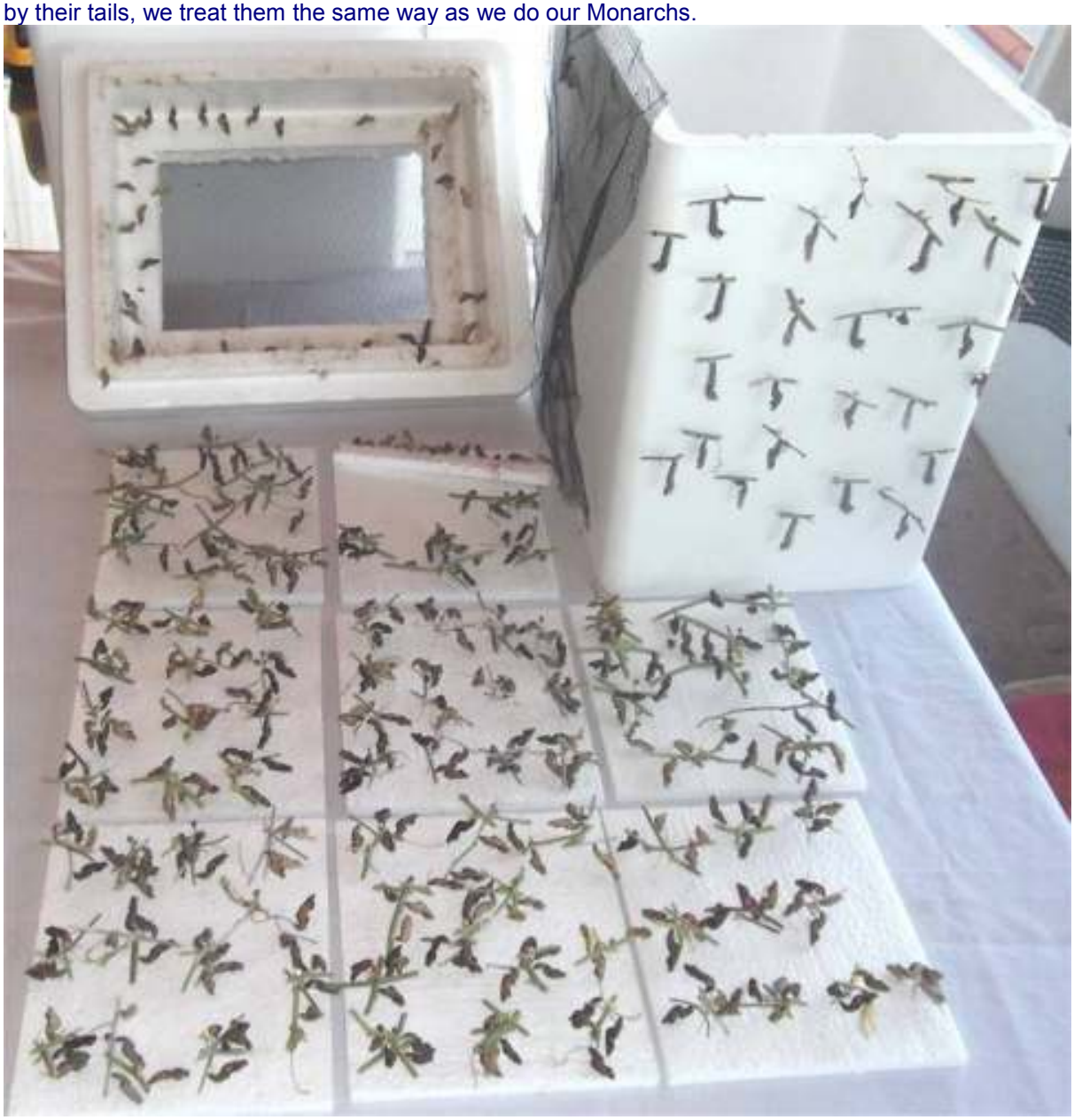


Above is an example of a single cage where we breed Monarchs, we never touch the pupae that form in the top of the cage, and photo 1 shows 120 pupae, and photo 2 shows the start of a successful emergence later. Photo 3, shows another 68 pupae that formed on the vines lower down in the same cage. A total of 180 pupae. (Try and count if you like!) Notice that where we can, we cut the stems where the pupae forms, and don't remove them from their silk pads.

This cage was part of a bank of 20 identical cages in a line, and we bred our maximum amount of Monarchs, (in a single month), last spring to meet some huge orders, of 7000 Monarchs.
I have to say we also backed these breeding numbers up using Styrene boxes.

So how do we deal with the cut stems with pupae?

A change of view, and now we move to “Longwings” (Heliconid) butterflies, but as they too hang by their tails, we treat them the same way as we do our Monarchs.



These were all bred in a single styrene box, and this is the end result. You notice that just as we do with the Monarchs pupae that form on plant stems, here, I have cut the stems,
but then, I pushed a dress making pin through the stems and grouped the pupae, to ensure that when hung they will hang horizontally, and not be affected by the vertical box wall.

Now some close-ups of how we treat our pupae that need to be completely moved, and are not attached to stems.

We use a contact glue, and just put a tiny drop on the tail of the pupa and also a drop on the end of a dress-making pin. We just leave the glue to dry for 5 mins or so, and then make the contact. See below.

We found we had a much better emergence rate by moving th pupae away from the vertical side of the box. On the left, there are two options, one pupae is stuck to a small Styrene pad, if this is easier for you, then try it. As for us we prefer the direct pin approach.

Here is a photo of how we deal with our Swallowtail pupae, (and all those species that form a silk girdle when they pupate).

Remember that these form with a silk girdle, and we, use a totally different approach for these species. We like to ensure that they are in a natural position to emerge, and here are two options for you to consider. One, just squeeze a “Worm” of acrylic on to corrugated cardboard, and just poke the end of the pupae into the Acrylic “worm” with the legs and wings facing inwards in the correct position. The position is almost identical to if they were being held by their silk girdle. On emergence, they have an instant grip, and we found this prevented many cripples. Lower down is really an identical situation, but we used contact glue.

Do be careful here, because if you use Silicone, as an alternative to Acrylic, you will find that Silicone emits fumes as it cures, and this can present problems for the Pupa.

Anyway, I hope you find this interesting and helpful. And don’t forget everyone, I am always so keen to see what you do with your pupae!
Nigel