

# An Incident of Triplets in the Red-footed Tortoise, *Chelonoidis carbonaria* (SPIX, 1824)

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The captive breeding of chelonians is a rewarding endeavor. There are many reasons for this that go beyond the simple pleasure of seeing hatchlings emerging from their eggs. For example, turtles and tortoises that are reproducing in captivity demonstrate that the care given to them is to their liking and that they are healthy. We also learn more about these animals and gain insights into their biology in the wild. Occasionally keepers will witness an unusual or remarkable event during the time they spend caring for their animals and these events can be recorded for others to learn about. Since 1973 I have been keeping *Chelonoidis carbonaria* and have been getting successful reproduction from the species since 1979. For much of this time period most of the tortoises I maintained were animals imported from Colombia, Surinam or Guyana. But beginning in 2001 I started to have breeding from a group of *Chelonoidis carbonaria* cherry head Red-footed Tortoises that I obtained as juveniles in the 1990's. These Red-headed tortoises were allegedly imported from Brazil.

Recently I was able to record the live hatching of three neonate cherry head Red-footed Tortoises *Chelonoidis carbonaria* from a single egg that was produced by one of my females. The following account documents this unusual event.

## A Female Nests

The mentioned female cherry head Red-footed Tortoise, was obtained as a juvenile with a straight carapace length (s.c.l.) of only 15 centimeters in 1999. By late 2002 this female was grown to a size of over 26 centimeters (s.c.l.) and had started to lay fertile eggs regularly. Typically she produces four or five clutches each year. The eggs in these clutches have ranged in number from one to seven.

Currently, she measures 30 cm (s.c.l.) and has not grown significantly in the past several years.

On April 22, 2011 this female tortoise nested and produced four eggs. This group of eggs was the sixth clutch of her nesting season. The previous clutches of eggs produced by her were on 9/13/10; 10/14/10; 11/22/10; 1/25/11 and then 3/16/11. These prior five nestings contained twenty three eggs and so those last four brought her



**Fig. 1**

The hatching process is begun right at a place where there were extra deposits of calcium on the outer eggshell.

total to twenty seven eggs in total. According to literature cherry head Red-footed tortoises seems to produce fewer clutches which usually contain fewer eggs than other red-

foots (HUMMEL & FELSNER 2003, VINKE et al. 2008). Up to around 2005 I made the same observation (MAY 2004). But since I found that female cherry head Red-footed

tortoises often produce five or six clutches a year, with larger females (over 30 cm s.c.l.) produce larger clutches that might range from seven to nine eggs each.

As an example a large female in my care that has been raised since she was a small juvenile. This female is currently 35 cm s.c.l. and weighs around 9.5 Kg. Although she typically lays only four or five eggs per clutch she has also produced clutches of eggs numbering seven, eight or even nine, with 100% fertility. The eggs produced by this giant female have also been rather large with an average size of 4.8 cm in diameter. Still another female in my care that is 27 cm s.c.l., regularly produces clutches numbering from six to eight eggs but these eggs are slightly smaller and more elongated in shape with an average size of 4.7x3.7 cm.

The eggs from the April 22 clutch were measured (see table 1) and then placed in a Hova-Bator (model 1602N G.Q.F. Mfg. Co., Inc.) incubator, all of them had been of average size, shape and appearance. Vermiculite was used as a substrate. The sex of *Chelonoidis carbonaria* is determined by the incubation temperature (RENUST 1994). The pivotal range of temperature shifts according to the animals origin within the species huge area of distribution. (VINKE et al. 2008). The eggs were incubated at 26 to 29 °C.



**Fig. 2a-b**

When it was clear that there was more than one neonate within the egg, it was partially opened. But I still had no idea that there were actually three hatchlings inside.

Egg no.	length [cm]	width [cm]
1	5.15	4.4
2	4.6	4.3
3	4.8	4.5
4	4.3	4.0

**Table 1**

Measurements of the eggs of the sixth clutch of the female during that season.

During the years 2009 and 2010 this female produced eggs from which a certain number of hatchlings emerged that possessed nuchal scutes (see MAY et al. 2010.) However, even though this female has continued to breed with the two males that potentially contributed to the appearance of the nuchal scute bearing neonates, no hatchlings have been produced with that trait since 2010.

### The Eggs Begin To Hatch

The incubation period of my cherry head Red-footed Tortoises ranges from 120–210 days, sometimes with a bimodal hatching and a difference up to three months. On August 23, 2011 after 124 days of incubation, eggs #2 and #4 began to hatch. After a day or two a single, normal hatchling emerged from each of these eggs. On August 26, 2011, after 127 days of incubation egg #1 began to hatch and from it too another normal hatchling emerged. This left egg #3 yet to hatch. This particular egg was somewhat unusual as it possessed extra calcium in the shape of lines or 'blobs' on the outer surface of the shell.

Finally on September 3, 2011, after an incubation period of 135 days, egg #3, the last egg from the April 22 clutch, began to hatch (see table 2).

### Triplets

A small nose had forced its way through the egg shell and it remained this way for a day with little change. On the morning of September 5 there was a larger opening and I could see the head of a hatchling protruding from the egg. But something didn't look quite right to me. As I picked up the egg to examine it closer I

noticed what appeared to be a hind foot right next to the hatchling's head. I know from experience what a hatchling is supposed to look like and this clearly wasn't

right. My first thought was that the neonate might be severely deformed somehow but as I turned the egg in my hand I discovered the reason for the hind foot next to



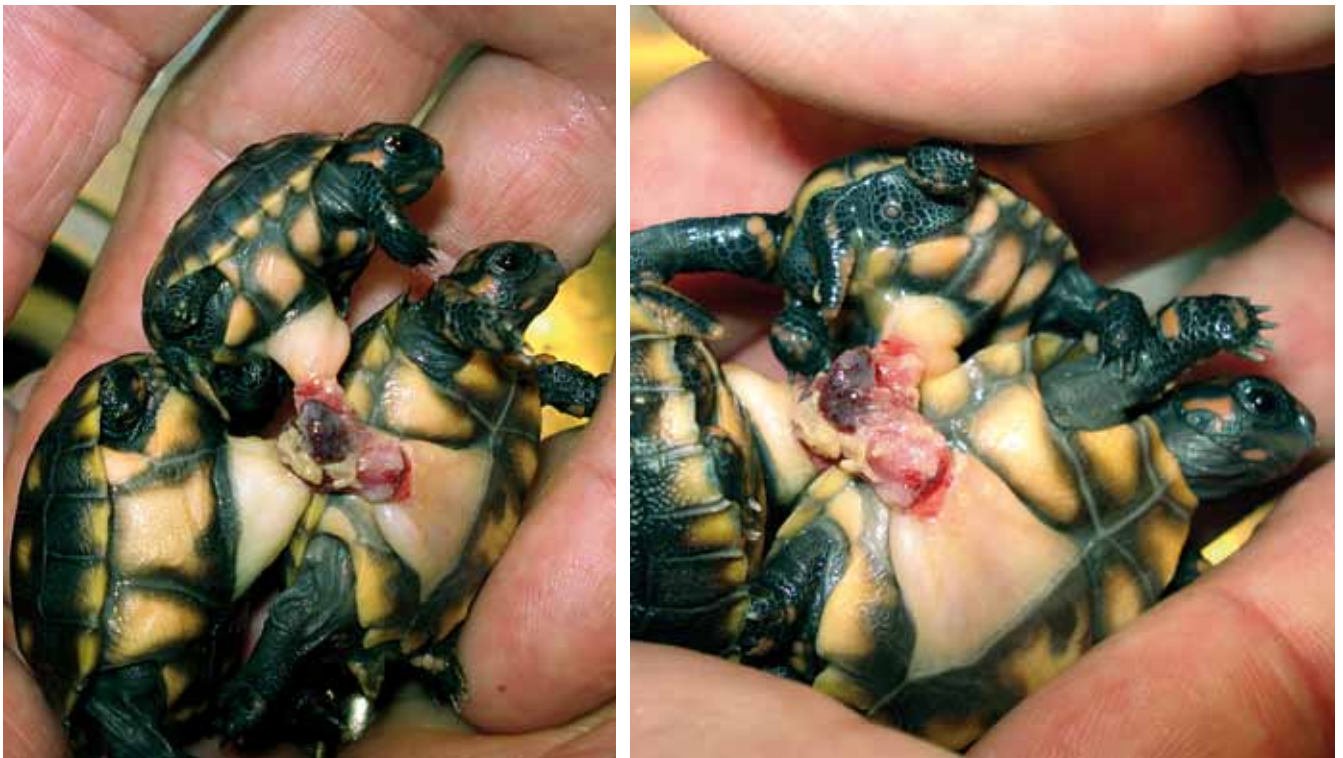
**Fig. 3a–b**

This photo was taken immediately after the egg was fully opened manually revealing three perfectly formed live hatchlings.



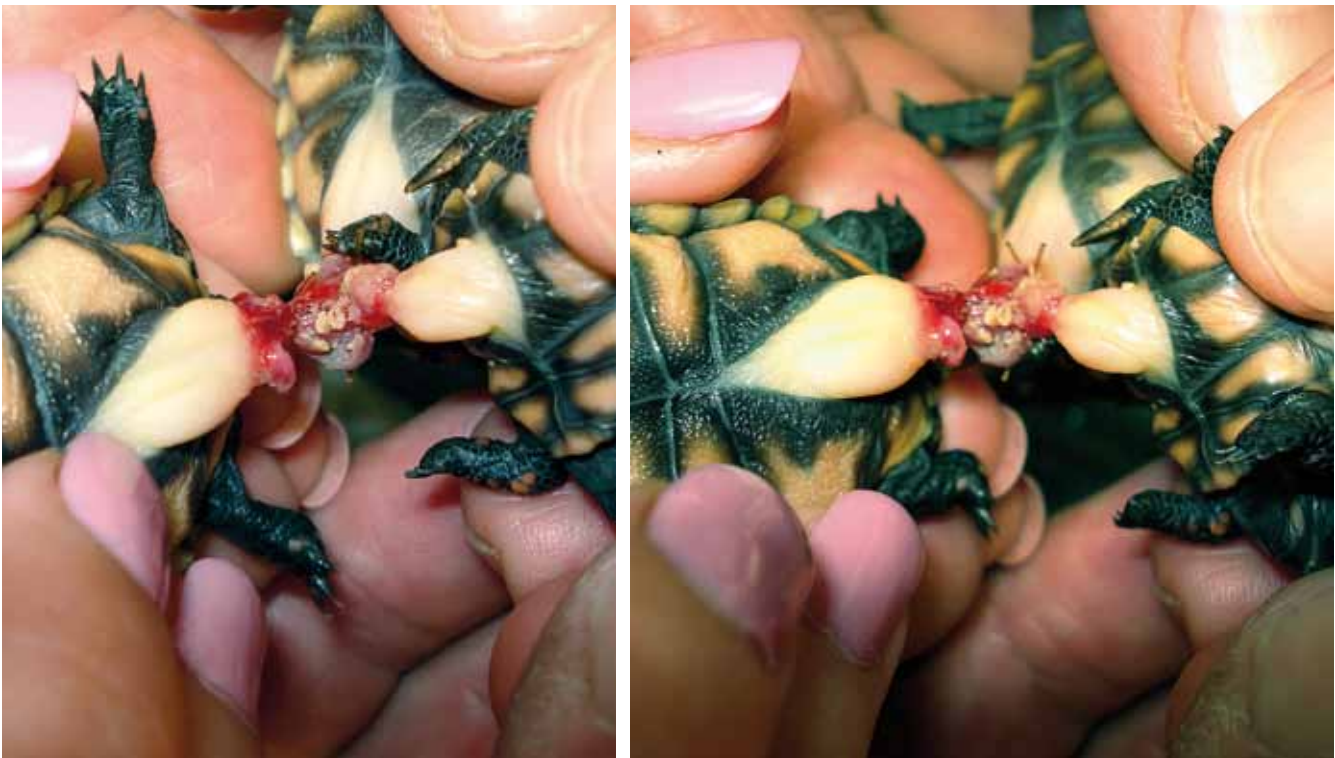
**Fig. 4a-c**

Back inside the egg incubator to finish absorbing their yolk sac. The attached hatchlings assumed odd positions but they never looked comfortable.



**Fig. 5a-b**

The joined yolk sac is becoming smaller (a). It is obvious how much the yolk sac membrane is getting stretched by each hatchling pulling away from the other two (b).



**Fig. 6a-b**

It took many hands to hold the hatchlings steady while Dr. Porcher worked (a). You can see the Chromic gut sutures just before they were separated.

the neonate’s head—there was another head protruding from the opposite side of the egg! I called my wife over to see this odd spectacle. “Twins!” she exclaimed and I thought it logical that she should be so excited as she herself is a fraternal twin.

As we examined the egg closer it was discovered that one of the hatchlings was upside down within the egg and that they were joined to a single yolk sac. We decided to open the egg fully and remove the two hatchlings to prevent any possible problems with them hatching further. The egg shell was mostly split into two halves

and so I gently turned it over into my palm to allowing the hatchlings to be free from the shell. At that time my wife and I received quite a shock—what spilled into my hand was not a set of twins but was instead, triplets! There was a

third and much smaller neonate attached to the same yolk sac as two we had already seen. It was immediately clear that all three of these hatchlings were alive and outwardly normal in appearance, although very small.



**Fig. 7**

The three triplets immediately after being separated. They now have their own umbilicus. The two larger neonates weighed 14 grams each. The smallest was only 4 grams in weigh.

Egg no.	Incubation period [days]
1	127
2	124
3	135
4	124

**Table 2**

Incubation period of clutch no. 6.



**Fig. 8a-b**

Four days after the separation, one of the larger triplets nearly used up its yolk sac (a); also the yolk sac of the smallest triplet, named 'Peanut', became smaller and smaller. The suture on the umbilicus can clearly be seen here.

I had hatched a set of twins from a single egg in the early 1980's although they each had their own yolk sac and were not attached to each other. I also know several other keepers who have likewise

produced twins from single eggs. It is a rare event but it happens. But I had never even heard of live triplets before.

As the three neonates were attached to a single large yolk sac

the fear was that they might tear this membrane at some point. All three of the hatchlings were in opposed positions and so if one was upright, the other two were in unnatural positions. So we quickly placed them into some damp paper towels to keep them from moving about and then returned them to the incubator. We were very nervous about what to do about the connected yolk sac. Should we separate it? Should it be left alone to see if the hatchlings would separate on their own? The new hatchlings had shifted in the incubator and they were all laying on their plastron with the yolk sac stretched way beyond what I had imagined it could be. There was also some blood at the point where the hatchlings umbilical cords were joined due no doubt to the stress put on the juncture. After consulting with other keepers who had experience with hatchlings connected to the same yolk sac, it was decided that they should be separated.



**Fig. 9**

The triplets along with the three other hatchlings from same clutch of eggs. There is much variation in color among them.

### Separation

Fortunately a friend of ours, Dr. DALE PORCHER, is an experienced reptile veterinarian and so I sent him photos of the connected triplets and we discussed what to do next. Dr. PORCHER felt as I did that the time had come for the three to be freed from one another. On the afternoon of September 6 I care-

fully drove the tiny cluster of cherry heads over to Dr. PORCHER's office.

With the help of two assistants and myself, Dr. PORCHER ligated each umbilicus as far from the respective hatchlings as possible to preserve as much of the yolk and he could. The umbilicus were ligated with 3-0 Chromic Gut and

then dissected away from each other. At that time each neonate, now free from its siblings, were weighed.

The two larger hatchlings each weighed only 14 grams making them very small indeed. But the smallest triplet weighed an astonishing 4 grams—how could it possibly survive?



**Fig. 10a-d**

Peanut takes his first bites of food. He was first offered finely chopped mushrooms, lettuce, boiled sweet potato and the commercial Mazuri tortoise chow.

The three separate hatchlings were brought home and then returned to the incubator where it was hoped they would continue to absorb their yolk sacs. For the next few days they moved very little but when checked each was found to be absorbing the yolk attached to them although the smallest was doing so much slower than his larger siblings. Still, he was alive. We decided to name the three ‘Huey’, ‘Dewey’ and the smallest, ‘Peanut’.

As the yolk sacs were becoming smaller, once a day each hatchling was placed in a bowl with a centimeter of warm water so they could drink for a few minutes. When

the yolk had been almost entirely absorbed they were offered food in tiny amounts.

On September 13 each hatchling was measured for straight carapace length with Huey being the largest at 4.0 cm. Dewey was 3.9 cm, but Peanut was only 2.85cm—the size of a large *Kinosternon* hatchling!

### Feeding

The first food items we offered only a few days after their separation, was the commercial tortoise food produced by the Mazuri company (PMI Nutritional International) (note of editor: hay pellets comparable to Reptosan or

Agrobs in Germany) and finely grated mushrooms. The Mazuri tortoise pellets were soaked in water to soften them, broken into manageable portions and offered to the neonates which still remained in the incubator out of two reasons: 1: during years of breeding this species I often observed hatching neonate Red-footed Tortoises, that were still inside their egg, extending their heads and beginning to eat the incubation substrate, long before their yolk sac would be fully absorbed. 2: Because these triplet hatchlings were so small I felt that getting them some added nutrition as soon as possible would help



**Fig. 11**  
A ventral view of the triplets at four weeks of age. The two larger neonates have shed their yolk sac membranes.





**Fig. 12**  
The triplets at six weeks. You can see clear signs of growth now.

their progress. The little hatchlings all took these items readily but the two larger neonates, Huey and Dewey, consumed food much more eagerly than the little one named Peanut. Other food items were incorporated into the diet and these included finely shredded lettuce of various kinds, hibiscus flowers, cooked sweet potato, small amounts of banana and strawberries and then Zoo Med 'Repti Sticks' for aquatic turtles that were soaked in water to make them soft. Peanut would pick at food but he seemed to consume only very small amounts at a time. Nevertheless he did eat and slowly, very slowly he began to grow.

When Dr. PORCHER had separated each hatchling from its siblings there was some significant tissue from the umbilicus as well as the sutures themselves that

remained attached to each neonate. This gave me some concern because as time went on this tissue looked as if it might become infected. But thankfully at around three weeks of age this began to slough off from the plastrons of the hatchlings. In the case of the smallest neonate it took a full month for this to shed off.

At one month the three were again weighed and measured (see table 3).

As hard as it was to believe all three of the triplets had lived

and were growing. In fact, the two larger hatchlings were looking like, and acting like typical red-foot hatchlings.

Now, at seven weeks of age they give every indication that they will continue to grow and thrive. Even Peanut, the tiniest red-foot we've ever heard of, appears to be a survivor.

The three hatchlings that all emerged from the same egg will be kept together to compare their individual progress and see what the future holds for them.

Tortoise name	strait carapace length [cm]	weight [g]
Huey	4.7	22.8
Dewey	4.7	24.5
Peanut	3.15	7.3

**Table 3**  
Weight and size of the triplets one month after they emerged from their eggs.

### Acknowledgements

We would like to thank our friend of many years Dr. DALE PORCHER of Shores Animal Clinic in West Palm Beach, Florida USA for his calm demeanor and skills with such tiny tortoises. He is among a growing number of veterinarians who have taken up the practice of working with reptiles and amphibians and improving how we care for them.

### Literature

HUMMEL, F. & H. FELSNER (2003): Bemerkungen zu *Geochelone carbonaria* (SPIX, 1824) und Haltung und Nachzucht in menschlicher Obhut. – *Sacalia*, Stiefeln, 1 (1): 11–36.

MAY, C. (2004): Pflege und Vermehrung der rotköpfigen Köhlerschildkröte „Cherryhead“, *Geochelone carbonaria*. – *Schildkröten im Fokus* 1 (4): 3–12.

MAY, C., H.-J. BIDMON, J. R. BUSKIRK & S. VINKE (2010): Über das Auftreten eines Nackenschildes bei einer Südamerikanischen Landschildkröte, *Chelonoidis carbonaria*. – *Schildkröten im Fokus* 7 (2): 11–20.

RUNDQUIST, E. M. (1994): Breeding the red-footed tortoise in captivity. – *Captive Breeding* 2 (3): 17–22.

VINKE, S., H. VETTER, T. VINKE & S. VETTER (2008): South American tortoises. *Chelonian library* 3. – Frankfurt am Main (Edition Chimaira), 360 pp.

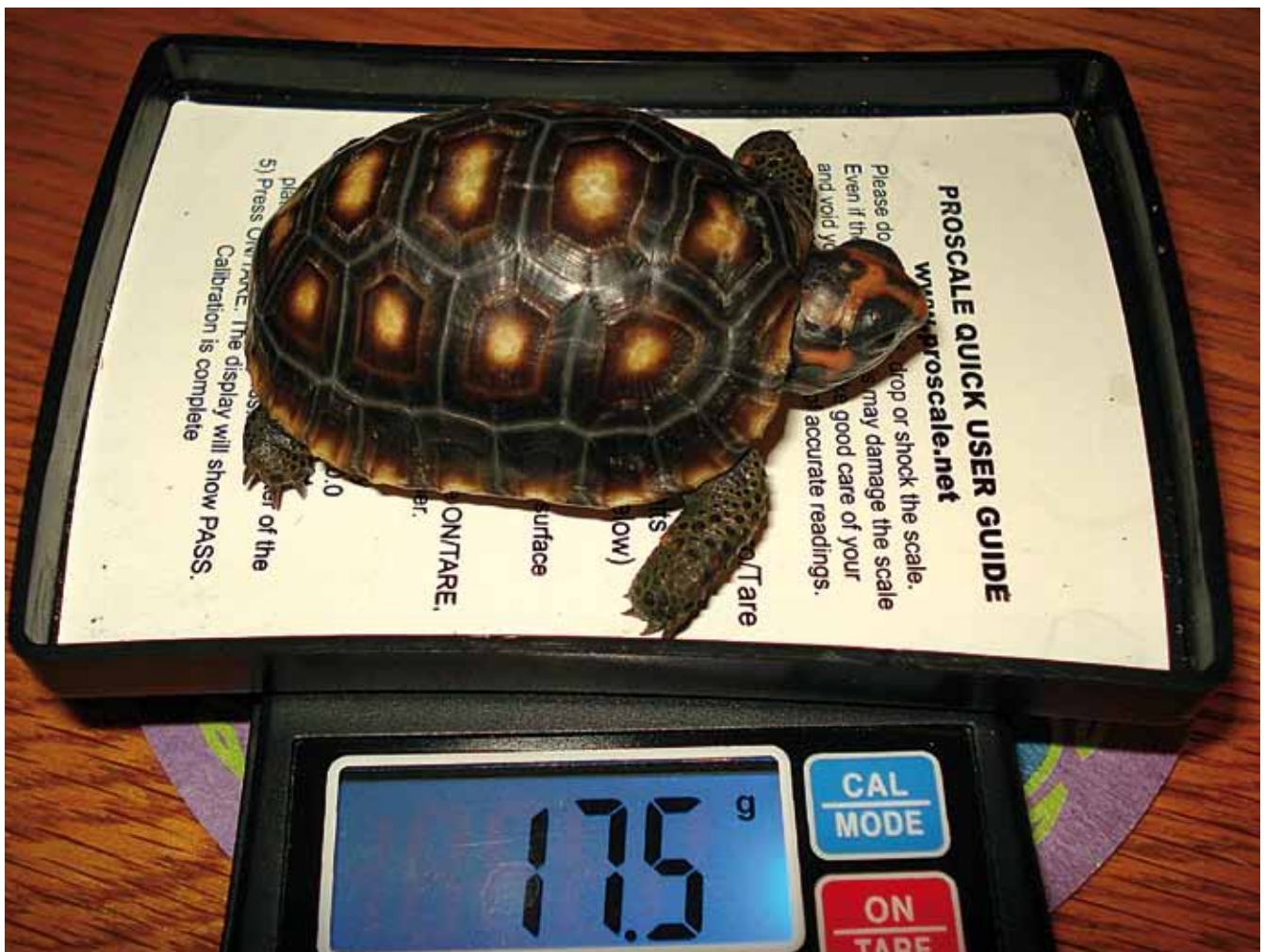
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**Fig. 13**

Peanut in the age of 13 weeks. His birth weight of 4 g is already multiplied.