

A Look at the Hinge- back Tortoises

E. J. Pirog



Forest Hingeback tortoise (*Kinixys erosa*). Photo by Russ Gurley.

The Hingeback tortoise is one of the most unique tortoises in the world, with the distinguishing feature of being the only chelonian to have a hinged carapace (which is how its common name was derived). This hinge is located just forward of the rear legs and can extend vertically up as high as the vertebral scutes, depending on the individual or form of Hingeback tortoise. This hinge allows the Hingeback to close the gap between the carapace and the plastron in the rear of the tortoise which provides physical protection of the soft hind parts of the tortoise.

There are two distinct forms of Hingeback tortoises consisting of a forest type and a grassland type. Of these two types there are two forms of forest type Hingeback tortoises and four forms of the grassland type.

Kinixys erosa and *Kinixys homeana*. These are easily differentiated from each other by the appearance of the first vertebral scute up from the tail. This scute on *Kinixys homeana* comes to a pointed,

conical shape along the spine with the back side of the cone dropping vertically to the tail end. This last vertebral scute on the back of *Kinixys erosa* is rounded in shape and tapers gradually towards the tail end. *Kinixys erosa* is also generally larger than *K. homeana* as adults. Both *Kinixys erosa* and *Kinixys homeana* are found in west Africa. *K. homeana* has the more restricted range and occurs along the coast of Africa from Liberia to Cameroon. *K. erosa* occurs in roughly the same range as *K. homeana* but extends further north to Gambia and further inland into the Congo. Although these two tortoises occur within a similar range, they occupy slightly different habitats. *K. erosa* prefers almost wet areas where it is frequently found in and around swamps, streams, and heavily vegetated boggy areas. It is even reported to be an adept swimmer. *K. homeana* also prefers moist areas, but is more commonly found in the heavily forested areas that border the areas frequented by *K. erosa*.

Both of these tortoises are omnivorous, as are all the Hingeback tortoises, but their particular diet is determined by the habitat they choose to live in where they feed on snails, fish, and various other aquatic forms of life. They will also feed on aquatic vegetation in addition to forest vegetation such as mushrooms, which are a favorite among most Hingeback species.

Because of its secretive nature, there is not much information on the breeding habits of *K. erosa* in the wild, but it has been found that they create shallow leaf-covered nests which contain up to four relatively large eggs. The nest is usually located close to water. Nesting habits for *K. homeana* are reported to be similar to that of *K. erosa*.

The grassland type Hingeback tortoises consist of *Kinixys belliana*, *Kinixys lobatsiana*, *Kinixys natalensis*, and *Kinixys spekii*. These can be very difficult to differentiate between each other. The only sure way to identify these different species or forms is to know the exact location of the origination of the tortoises in question. These tortoises are easily distinguished from the forest type Hingeback tortoise by the less angular shape and less scalloped marginal

scutes that border the rear of the tortoises.

Kinixys belliana has the most extensive range of the group and it occurs throughout the range of the Forest Hingeback in addition to ranging from Somalia south to Swaziland and west to Zaire and on to western Africa to Senegal. The remaining Hingeback tortoises have very limited ranges which makes identification of these forms easy if the origin is known.

Kinixys lobatsiana is found only in northwestern South Africa and southeastern Botswana.

K. natalensis is found from Swaziland to southern Mozambique.

K. spekii is found in northeastern South Africa and ranging slightly into Mozambique in addition to ranging into all of Zimbabwe. Although these have a limited range, their ranges do overlap with the range of *K. belliana* so differentiating between them and *K. belliana* can be difficult. In fact, these three species were at one time considered subspecies of *K. belliana*.



Natal Hingeback tortoise (*Kinixys natalensis*). Photo by Donald Schultz.



Bell's Hingeback tortoise (*Kinixys belliana*). Photo by E. J. Pirog.

Although these are called grassland type Hingeback tortoises, they all share the same habitat trait in that they all have proven to be highly adaptable. These tortoises have been found to occupy habitats ranging from grassland, to brushland, to forest, to rocky outcroppings. The most common factor in all these habitats is that they are all not as moist as the habitat occupied by the forest type Hingeback species.

The grassland type Hingeback tortoises are omnivorous. They feed on a variety of weeds, grasses and fruit in addition to various invertebrates such as snails, centipedes, and the like. They have also been known to feed on carrion and are extremely opportunistic feeders.

The range of the grassland tortoises is so extensive they range into areas where they do experience seasonal cycles. Some are even known to actually have a winter rest period similar to hibernation. In those areas where the grassland Hingeback tortoise does occur, where they experience extreme heat or drought, they will aestivate or hibernate to survive these extreme conditions. This is mentioned here because these rest periods sometimes serve as cues for mating and breeding behavior. Breeding and nesting usually takes place from November to April,

which corresponds to the spring to the end of summer in the southern hemisphere.

During nesting, these tortoises can lay between 6 to 8 eggs in an average clutch. Incubation of the eggs in nature is highly variable because of the extensive range of this type of Hingeback and the various habitats the tortoises inhabit. Those that occur at higher altitudes or in the more southern portions of the range tend to take longer to hatch and those in the more northern part of their range have shorter incubation periods.

Captive care for the forest type and the grassland type of Hingeback tortoises are quite different from each other. The forest Hingebacks require the kind of accommodations that would normally be provided for more tropical tortoises such as Yellowfoots.

The forest Hingebacks do best in a warm, humid environment with a moist soil substrate. It is also beneficial if the enclosure can be well-planted. Unless the indoor enclosure is large enough, planting can be difficult because these tortoises can be quite active and destructive as a result of that activity so careful selection of hardy plants is a must. A 2 foot by 8 foot indoor enclosure is adequate for a pair of forest Hingebacks but an outdoor enclosure



Spek's Hingeback tortoise pair (*Kinixys spekii*). Photo by E. J. Pirog.

would be the most ideal environment if one can be provided. Frequent spraying is also beneficial to these tortoises. During those sprayings, the tortoises become very active. It is believed that these sprayings sometimes actually induce breeding behavior in the forest Hingebacks. A water dish should be provided as an added element of its natural environment. If maintained indoors, a temperature of 75 to 85° F should be maintained. Spot lights can be used for basking, but they should be of a low intensity light because these tortoises usually shy away from bright light. For this reason, ceramic heat sources are suggested to maintain proper temperatures.

The diet for the Forest Hingeback should be as varied a diet as can be provided. Some suggested food items would be any kind of earthworms, wax worms, crickets, and even goldfish, in addition to plant material such as dark leafy greens and similar items. Most forest Hingebacks also have a special fondness for mushrooms. There are many varieties of mushrooms that are readily accepted. Fibrous fruits are also eagerly accepted but should be fed on a relatively limited basis.

As mentioned earlier, care for the grassland Hingebacks such and the Bells and Speke's Hingeback

tortoises is quite different from the forest Hingebacks. This type of tortoise does best in a relatively dry environment. Indoor enclosures should be roughly the same size as the forest Hingeback enclosure with a size of 2 foot by 8 foot being a good starting size for a pair of these tortoises. The enclosure should be maintained with a temperature range of 75 to 90° F. An outdoor enclosure is always the best environment for tortoises if one can be provided. The grassland tortoise has such a large range it seems to tolerate a greater variance in environmental conditions so there are greater opportunities for maintaining these in an outdoor enclosure. Even though they do prefer a drier habitat than the forest Hingeback tortoises, they do enjoy a well-planted and furnished enclosure. These tortoises also like to climb, so a rock structure with hides and adequate footholds should be provided which they will readily make great use of. A water dish should be provided for drinking. Occasional spraying is also enjoyed by these tortoises but the substrate should be allowed to dry out between sprayings. Feeding is identical to the forest Hingebacks with the exception of the aquatic items. These are not normally fed to the grassland Hingebacks.

Both types of Hinge-backs should also be provided with a good multivitamin on a weekly basis. This is not very important if a varied diet is provided but calcium carbonate is always recommended for any tortoise. There is one caution for any of these types of tortoises. Wild-caught imports are notorious for carrying a multitude of parasites, both internal and external. A veterinary visit is a must for any new imports of this species.

Both of these tortoise types make fantastic companions even though they have different requirements. When properly maintained, they are very animated and full of individual personality.

Literature

Kinixys belliana

Broadley, D. G. 1989a. *Kinixys belliana*. Bell's hinged tortoise. In: I. R. Swingland, and M. W. Klemens (eds.). *The Conservation Biology of Tortoises*, pp. 49-52. Occ. Pap. IUCN/SSC 5, Tortoise and Freshwater Specialists Group. IUCN, Gland, Switzerland.

Broadley, D. G. 1993. A review of southern African species of *Kinixys Bell* (Reptilia: Testudinidae). *Ann. Transvaal Mus.* 36: 41-52.

Laurent, R. F. 1962. On the races of *Kinixys belliana* Gray. *Breviora* (176): 1-6.

Swingland, I. R., and M. W. Klemens (eds). 1989. *The conservation biology of tortoises*. Occ. Pap. IUCN Species Surv. Comm. 5: 1-202.

Kinixys erosa

Blackwell, K. 1966. Coital behaviour of the African tortoise *Kinixys erosa*. *British J. Herpetol.* 3: 289.

Broadley, D. G. 1989d. *Kinixys erosa*. Serrated hinged tortoise. In: I. R. Swingland, and M. W. Klemens (eds.). *The Conservation Biology of Tortoises*, pp. 56-57. Occ. Pap. IUCN/SSC 5, Tortoise and Freshwater Specialists Group. IUCN, Gland, Switzerland.

Eglis, A. 1962. Tortoise behavior: a taxonomic adjunct. *Herpetologica* 18: 1-8.

Kinixys homeana

Broadley, D. G. 1989e. *Kinixys homeana*. Homes's hinged tortoise. In: I. R. Swingland, and M. W. Klemens (eds.). *The Conservation Biology of Tortoises*, pp. 58-59. Occ. Pap. IUCN/SSC 5, Tortoise and Freshwater Specialists Group. IUCN, Gland, Switzerland.

Eglis, A. 1962. Tortoise behavior: a taxonomic adjunct. *Herpetologica* 18: 1-8.

Kinixys spekii

Broadley, D. G. 1989b. *Kinixys spekii*. Speke's hinged tortoise. In: I. R. Swingland, and M. W. Klemens (eds.). *The Conservation Biology of Tortoises*, pp. 52-54. Occ. Pap. IUCN/SSC 5, Tortoise and Freshwater Specialists Group. IUCN, Gland, Switzerland.

Broadley, D. G. 1993. A review of southern African species of *Kinixys Bell* (Reptilia: Testudinidae). *Ann. Transvaal Mus.* 36: 41-52.

Hailey, A., and I. M. Coulson. 1995. Habitat association of the tortoises *Geochelone pardalis* and *Kinixys spekii* in the Sengwa wildlife research area, Zimbabwe. *Herpetol. J.* 5: 305-309.

Hailey, A., and I. M. Coulson. 1996. Nesting behaviour and clutch and egg size of the hingeback tortoise *Kinixys spekii*. *British Herpetol. Soc. Bull.* 58: 11-18.

Lambiris, A. J. L., J. C. Lambiris, and S. A. Mather. 1987. Observations on Speke's hinged tortoise, *Kinixys spekii* Gray (Chelonii: Testudinidae). *Herpetol. Assoc. Africa, Proc. 1987 Confr.*: 68-71.

**WE WOULD LIKE TO INVITE YOU
TO THE TTPG CONFERENCE ON
CAPTIVE CARE AND BREEDING in
MESA, ARIZONA in NOVEMBER.**

**BE SURE TO "LIKE" the TURTLE AND
TORTOISE PRESERVATION GROUP
on FACEBOOK!**