



Breeding Research project EHAP: Exchanging Experiences on Keeping and Breeding the Madagascar flat-tailed tortoise (*Pyxis planicauda*)

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The goal of Project EHAP is to conduct research on optimal breeding and husbandry conditions as a contribution to the conservation of the critically endangered Madagascar flat-tailed tortoise (*Pyxis planicauda*). Husbandry of this species is not well documented or understood, as until recently, this species has rarely been kept outside of Madagascar. This project seeks to develop and document techniques which can be used to successfully keep and breed this species.

It was the discovery of a hatchling in the adult enclosure in 2003 that provided the inspiration for more intensive work with this species. The hatchling had been produced from an egg laid in September 2002 and hatched during the summer of 2003. It turned out that the biggest problem with successfully hatching *P. planicauda* previously here, and at other institutions, had to do with the temperatures used during incubation. Between 2000 and 2003, all of the eggs produced died at various stages during the incubation process. It was discovered that by using a one-month cool down period (13°-15°C), after the first month of incubation, the hatch rate could be significantly increased. Temperatures were increased again at the beginning of month three.

In 2006, after producing six hatchlings, it was decided to start intensifying the breeding project with *P. planicauda*. After being delayed for almost a year by permitting challenges, the researchers partnered with the Zoological Institute of Basel University (Professor Dr. Dieter Ebert), an official project was initiated and a cooperation contract was developed.

In March 2008, six juveniles were exported from Basel to Germany; a process which was complicated by CITES and border regulations. That same year, 17 of the 22 hatchlings were transferred to six different



Indoor set up showing metal halide lights and ultrasound misting system at work.

locations in Europe where they would be kept to rear to adulthood. The keepers at each location are asked to keep and report records on growth and photograph the animals on a regular basis. Although there has not been any mortality with the offspring sent out, in some cases the hatchlings have required an adjustment period of up to a year before completely settling in and growing at the same rate as before the move. Weight increase either stopped completely within this period or was just marginal. The hatchlings are kept in protected outdoor enclosures in order to supply them with sufficient UV light during

the warmer seasons. These animals are to be held and maintained at their current facilities until 2013. The following year tortoises will be moved around for breeding purposes.

Terrarium selection for *P. planicauda* is based on the “Minimum requirements for keeping reptiles”, dated January 10, 1997. Terrarium sizes are chosen as follows: length equals four times carapace length and width equals half of terrarium length. Carapace length is based on the largest tortoise kept in the cage. The average enclosure size is for two tortoises. To add either a third or fourth tortoise in the



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same terrarium, 10 % ground surface must be added to these measurements. 20% ground surface must be added for a fifth tortoise. Beginning in March 2009, metal halide spots and Reptistar FL UV A+B Sylvania tubes were used as the main lighting source while the animals are indoors. In April, these spot lights were swapped for metal halide Bright Sun UV Desert spots, which were sponsored by the Lucky Reptile Company. In order to increase the humidity, the researchers developed a special ultrasound misting system directly connected to the central distilled water supply system.



Juvenile *Pyxis planicauda*, 2003

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Continued: Breeding Research project EHAP: Exchanging Experiences on Keeping and Breeding the Madagascar flat-tailed tortoise (*Pyxis planicauda*)



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Several small incubators were constructed for egg incubation, each equipped with a thermostat capable of allowing a nighttime drop in temperature.

The adult breeding groups are composed as follows: Group 1: 1.2 specimens, Group 2: 1.2 specimens, Group 3: 1.1 specimens, and Group 4: 1.1 specimens. The first animal that was hatched at our facility turned out to be a male and is now paired with a subadult female that was legally imported into Switzerland. The tortoises are kept at the same temperature and humidity levels as what they would experience in the wild, thanks to data available from western Madagascar. Both juvenile and adult

tortoises have periods of inactivity, just as they would in nature. This dormancy period often lasts six months. During this period, the air humidity and day length are reduced. When the animals become active again, the day length is adjusted and the humidity is increased by adding the ultrasound humidifier. The humidifier is switched on seven times per day at 15-minute intervals during their active period. By doing so, an ideal micro-climate can be reached in which the tortoises thrive.

Several small incubators were constructed for the incubation of the eggs produced, each equipped with a thermostat capable of allowing a nighttime drop in temperature. Vermiculite is used as the incubation substrate. Regarding incubation, a number of questions still remain to be answered completely. One of the most frustrating challenges in the beginning of this experiment was the length of time required to see which incubation protocol was the most successful with this species. On



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Copulation between *Pyxis planicauda*



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Metal halide spotlights and the humidifier in the outdoor enclosure.

average, only ten eggs are produced each year and the incubation period ranges from 200 to 300 days. However, out of eleven tested incubation methods, a suitable method has been selected which is now used for the majority of the eggs

Project EHAP is supported by the scientific counsel of Henk Zwartepoorte (The Netherlands), Dipl.-Biol. Matthias Goetz (British Channel Islands) and Dr. Gerald Kuchling (Australia). Each was selected based on their herpetological experience, specifically with *Pyxis* reproduction or research. The members of the EHAP Project communicate on a regular basis in order to discuss problems and find solutions. It would be an advantage for the project if additional *Pyxis planicauda* keepers contacted the researchers in order to exchange experiences and skills.

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Note: EHAP is a German acronym for a phrase that translates to *Exchanging Experiences on Keeping and Breeding the Madagascar flat-tailed tortoise (Pyxis planicauda)*

This is one of the many captive breeding programs being carried out under the TSA Europe banner.