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Notes on Short-Term Movements and Dietary Spectrum of the Twist-Necked Turtle, *Platemys platycephala* (Testudines: Chelidae) in the Nouragues Reserve, French Guyana

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Abstract. – The twist-necked turtle (*Platemys platycephala*, Schneider 1792) is the only member of the genus *Platemys*. Despite a pan-Amazonian distribution in South America, ecology and population status of this small, forest-dwelling species are unknown in many countries within its range. Currently it is not listed in the IUCN Red List of Threatened Species, and there are almost no published data on reproduction, feeding, or habitat preferences in the wild. In this article, observations on habitat selection, short-term movements and feeding in the Nouragues Field Reserve, French Guyana, are reported for the first time. Study specimens used the same areas in the late rainy season of 2009 and 2010, moving total distances of 503–686 m over a period of approximately 3 wk within calculated areas of activity ranging in size between 0.73 and 1.59 ha. The main habitats used were palm swamps, temporary flooded forest, and primary nonflooded forest. The analysis of 4 stomach and 2 fecal samples showed that different classes of insects, worms and crustaceans as well as amphibian eggs were consumed as food items.

Key Words. – Reptilia; Testudines; Chelidae; *Platemys platycephala*; ecology; movement; habitat selection; diet; feeding; French Guyana

Platemys platycephala Schneider, 1792 is a small chelid turtle with an elliptical carapace (up to 17.5 cm; Vogt 2008) that is rather flat and of brown colour, perfectly mimicking decaying leaves on the forest floor. Due to the remarkable karyotypic trait of some specimens showing partial/mosaic triploidy (McBee et al. 1985; Bickham and Hanks 2009), the genus *Platemys* is considered monotypic (McBee et al. 1985). The twist-necked turtle occurs all over the Amazonian rain forest, including Bolivia, Brazil, Colombia, Ecuador, French Guyana, Guyana, Peru, Suriname, and Venezuela (Pritchard and Trebbau 1984; Iverson 1992). Currently, two weakly defined subspecies with a broad area of intergradation are recognized: *P. p. platycephala* Schneider, 1792 from the eastern parts of its range and *P. p. melanonota* Ernst, 1984 from the far western parts of Amazonia in Peru and Ecuador. Despite its vast distribution, it is a rarely encountered animal in the field. Therefore, although it is readily available in the commercial pet trade and often to be seen in zoological institutions, field studies on life history and especially published studies on diet, movement, or habitat use are scarce (Souza 2004).

Most observations on the natural history of *P. platycephala* come from captive specimens (Mittermeier et al. 1978; Métrailler 2005), but no detailed dietary studies are published for *P. platycephala* under natural conditions. *Platemys platycephala* is generally understood to be strictly carnivorous, feeding primarily on tadpoles and anuran eggs as well as some aquatic insects and small fishes (Métrailler and Le Gratiet 1996; Hero et al. 2001; Rueda-Almonacid et al. 2007; Vogt 2008), but none of these references rely on quantitative studies. There are also no published quantitative field studies on habitat selection. Souza (2004) classified the status of knowledge about activity patterns and reproduction in *P. platycephala* as ‘‘little known’’ and knowledge about alimentation as ‘‘unknown,’’ just like in many other South American and especially Amazonian chelid turtles. Only a few detailed records about natural food items of South American chelids in general are currently available (Fachín-Terán et al. 1995; Caputo and Vogt 2008; Alcalde et al. 2010; Brasil et al. 2010).

Examples from several species formerly placed in the genus *Phrynops* Wagler, 1830 (in which many of the chelid turtles of South America were placed in the 20th century) show that while they were believed to be strictly carnivorous, research on *Rhinemys rufipes* (previously named *Phrynops rufipes*) showed that these turtles consume a considerable amount of palm seeds and fruits (Magnusson et al. 1997; Caputo and Vogt 2008). Some authors also mention that *Mesoclemmys gibba*, which is thought to be a carnivore as well, occasionally consumes plant matter (Pritchard and Trebbau 1984; Rueda-Almonacid et al. 2007); Vogt (2008) even states that the fruits of the Buriti Palm are this turtle’s favorite kind of food. Therefore, to gain better insights in natural history of chelid turtles, basic ecological studies are needed.

Radiotelemetry has been used as an instrument for studies on movements and habitat selection of turtle species that may belong to different families but with comparable lifestyles like *Emys orbicularis*, *Glyptemys* *muhlenbergii*, *Rhinemys rufipes*, and *Vijayachelys silvatica* (Magnusson et al. 1997; Poschadel 2003; Pittmann and Dorcas 2009; Deepak and Vasudevan, 2010). For elusive species that cannot be caught easily in sufficient numbers, radiotelemetry can also be used to increase recapture rates and therefore increase numbers of microhabitat observations and fecal or stomach content samples. Vogt (2008) mentions that radiotelemetry-based studies have been conducted on *P. platycephala*, but to date these studies remain unpublished.

The occurrence of *P. platycephala* was recorded in the Nouragues Reserve, French Guyana, at least since 2008 (CNRS 2012a), and specimens are occasionally encountered by researchers working on other topics in the reserve (Gaucher et al., *pers. comm.*, February 2009) Still, no fieldwork on this species had been carried out in Nouragues until this study. In this article, I present observations on short- and long-term movements and dietary spectrum of *P. platycephala* in the Nouragues Reserve.

METHODS

The Nouragues Reserve lies in the eastern center of French Guyana and is nearly fully covered by primary rain forest. There are no villages in the reserve, and entrance is prohibited except for scientists and staff. The pristine habitats and two field stations (Camp Pararé and Camp Inselberg) provide perfect conditions for studies in an environment nearly free of anthropogenic influences. Camp Pararé, in which the fieldwork for this study was done, is situated directly along the Arataye River, granting access to river-influenced terrestrial habitats, such as temporary flooded forests and palm swamps. The geographic coordinates of the Camp are lat 4°02′N, long 52°41′W (CNRS 2012b).

Two field excursions to the camps in the Nouragues reserve were made in 2009 and 2010. Fieldwork occurred near Camp Pararé from 2 to 20 February 2009 and from 4 to 21 February 2010. Parts of the study were conducted as a side project of a field course offered by the University of Vienna.

To obtain specimens for the study, visual surveys and baited hoop traps were used. The visual surveys were performed along already established tracks near the Arataye and crossed multiple habitats, including temporary flooded forest, terra firma forest, and palm swamps. The traps were set up at sites comprised of different habitats close to the track, mostly in inundated areas, palm swamps, and forest streams with the opening lying underneath the water surface. Approximately a third of the trap was above the surface to prevent captured turtles from drowning. All traps were baited with canned sardines in oil with holes drilled into the can in order to facilitate spreading of scent. Every other day, the bait was exchanged for a new one. Traps were constructed of iron mesh (10-mm aperture) 1.5 m in length and approximately 70 cm in diameter. In 2009, 8 checks of the traps were performed from 12 to 19 February. In 2010, 11 checks occurred from 5 to 12 February in addition to the telemetry work.

For tracking secretive animals like *Platemys*, high-power radio transmitters (TW-3, Biotrack Ltd, Wareham, UK) were used, with individual frequencies in the range from 150.033 to 150.152 MHz and an estimated range of 2–4 km for ground-to-ground signal transmission in open conditions. They were outfitted with a 1/2 AA battery to ensure a working signal of the transmitter for more than 1 yr. Thus, turtles equipped with transmitters in 2009 could be tracked again in 2010. Following the suggestions by Kenward (2000) and the Biotrack website (Biotrack 2008), the tags were designed to be attached to animals of at least 250 g of body mass, weighing a maximum of 15 g, comprising a maximum of 6% of body weight. This excludes juveniles and subadults of *P. platycephala* but does not affect adults, as gravid females usually have to carry even more weight. All study specimens exceeded 250 g in body weight (Table 1). Due to the high humidity of the area and the partially aquatic lifestyle of the turtles, I used a nearly waterproof tracking device (SIKA Receiver; Biotrack). For comfortable use in the rain forest, a Biotrack YAGI-Antenna with flexible side arms was used.

Radio tags were affixed to turtle carapaces using a 2-component adhesive (Repair Express Powerknete, Pattex/Henkel). In 2009, radiotelemetry was used mainly to increase the number of stomach samples for dietary studies; therefore, the turtles were not followed every day to avoid continuous disturbance by picking them up and flushing their stomachs. From 5 to 9 February 2010, the turtles were tracked once a day due to time commitments for preparing turtle traps and searching for possible turtle habitat. After 10 February 2010, the turtles were tracked twice a day (morning after sunrise and late afternoon before nightfall) to monitor their movements during the day and overnight. Each turtle relocation site was recorded with a GPS device (Etrex Vista HCx; Garmin). Tracking bouts usually were 3–4 hrs, with total time in the field reaching 6–8 hrs per day, excluding night excursions and trap check walks, which were done additionally.

To determine if a turtle moved between two trackings, a red- and white-striped plastic ribbon was tied to a vine or branch above the resting turtle. This site marking technique was used in lieu of GPS use due to the poor GPS accuracy (up to 30-m imprecision) caused by the closed canopy of the study area. GPS inaccuracy is a widely known phenomenon in situations with canopy cover of more than 70% (Frair et al. 2010). GPS data were analyzed using Garmin Mapsource software and ESRI ArcView 4.2. Statistical tests were performed in MS Excel 2003. Maps and pictures were edited in Adobe Photoshop CS2. Detailed topographical maps, including rivers and creeks of scales below 1:100,000, were not readily available; therefore, a height model (resolution of 1-m altitude; Centre National de la

Table 1. Studied individuals of *Platemys platycephala* including details regarding movements and used areas of activity.[a]

Specimen	Year	Sex	CL (mm)	CW (mm)	PL (mm)	PW (mm)	M (g)	Study days	Trackings	Total distance	MD (m)	SD (m)	Min (m)	Max (m)	MDD (m)	SD (m)	MinD (m)	MaxD (m)	MDN (m)	SD (m)	MinN (m)	MaxN (m)	A (ha)
P1	2009	F	137	95	127	66	n.m.	4	5														
P2	2009	M	146	92	128	60	n.m.	5	5														
P1	2010	F	137	95	127	66	259	14	23	503	23	24	0	89	12	14	0	35	31	25	14	89	1.59
P2	2010	M	149	92	133	61	292	14	21	686	31	39	0	148	13	18	0	43	37	47	0	148	1.00
P3	2010	M	149	98	137	65	289	13	24	648	31	74	0	312	1	2	0	5	1	4	0	10	0.73
P4	2010	M	154	97	139	63	312	11	20	581	34	61	0	200	11	11	0	30	58	84	0	200	1.20

[a] CL = carapace length, CW = carapace width, PL = plastron length, PW = plastron width, M = mass, MD = mean minimal covered straight distance, SD = standard deviation, Min = minimum covered minimal straight distance, Max = maximum covered minimal straight distance, MDD = mean minimal covered straight distance during the day, MinD = minimum covered minimal straight distance during the day, MaxD = maximum covered minimal straight distance during the day, MDN = mean minimal covered straight distance during the night, MinN = minimum covered minimal straight distance during the night, MaxN = maximum covered minimal straight distance during the night, A = calculated area of activity, n.m. = not measured.

Recherché Scientifique, Guyana) showing the vicinity of the camp Pararé was used as basis for map production. Additionally, colleagues at the University of Vienna provided data on trails and small creeks of the near vicinity of the camp Pararé that were gathered during a geographical survey and were used for work on the poison dart frog *Allobates femoralis* (Ringler et al. 2009). Since the turtles were sometimes using habitats that were located in distances to the camp where both the height model and the data by Ringler et al. (2009) were not sufficient, an exact correction of possibly erroneous GPS data was not possible. Only in cases where a turtle had not moved between trackings but the recorded GPS data were not exactly matching was a geographical mean point calculated.

Because of the small data set, ''area of activity'' is used as a term for the area that has been used by the animals instead of home range. These areas of activity were defined by connecting the outermost tracking points for each specimen and calculating the area of the resulting polygon (minimum convex polygon method; see Burt 1943). Because of the small data set in 2009, they were calculated only for the 2010 field season.

Stomach contents were collected by gentle stomach flushing (modified from Legler 1977) shortly after capture. I used a chemical scoop to open the mouth and a pressure sprayer for plants connected to a tube 3/5 mm (inside/outside) in diameter to pump water into the turtles' stomachs. When the stomach was full (water was regurgitated), the turtle was flipped over with its head down, and the outflowing stomach contents were collected with a sieve. A turtle's stomach was considered empty if clear water was coming out of the turtles' mouth for more than 15 sec. After first capture, turtles were maintained in captivity for up to 2 d to recover fecal samples and to attach radio transmitters. Further stomach flushings on already equipped specimens were done directly in the field and at the end of the study when radio transmitters were removed from all turtles. Tracked animals were stomach flushed approximately once per week, an interval designed to minimize procedure-related stress and to allow full digestion of items consumed after flushing. Likewise, turtle feces were not sampled during the telemetry study so as to avoid the need to keep individuals captive for too long. Feces and stomach contents were frozen and transported to Austria, where dietary constituents were analyzed in the laboratory and identified to the lowest possible taxon.

To describe the habitats used by the turtles, physicochemical parameters of water bodies and terrestrial habitats were measured with a pH/temperature/conductivity multimeter by Hanna Instruments (HI-98129) and titration tests by JBL for carbonic hardness. Water depth was measured with a measuring stick, and stream velocity was calculated by letting a tennis ball float in the water body, measuring the time it took to pass a preset distance of 2 m. Canopy cover was estimated by

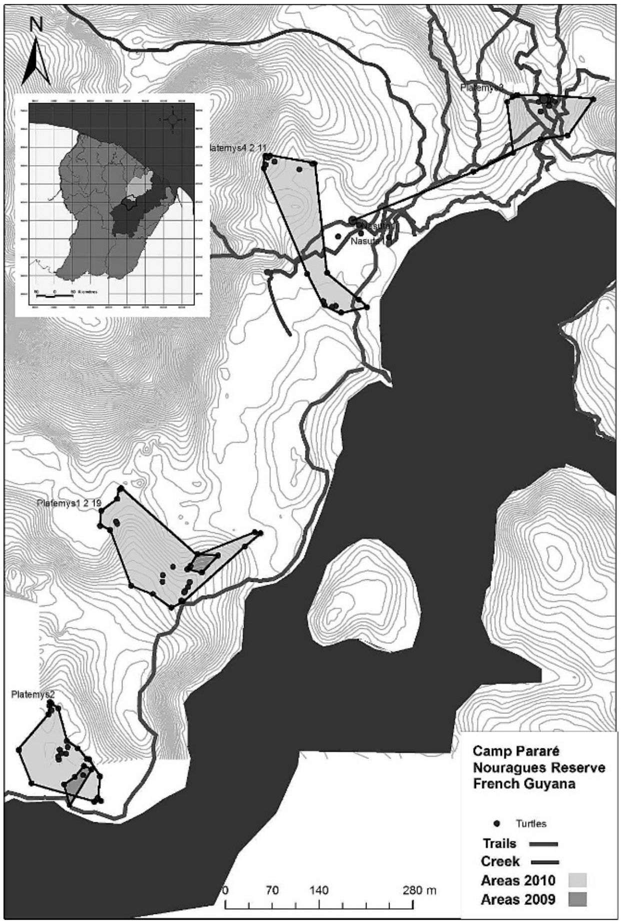

Figure 1. Map of the study area along the Arataye River. Marked areas with light filling indicate areas of activity in 2010, and marked areas with dark filling indicate areas of activity in 2009. Altitude difference between contour lines is 1 m. Insert: Map of French Guyana. Highlighted = the 2 districts (Roura, Regina) that the Nouragues Reserve stretches across.

comparing shaded areas to areas with patches of light on the forest floor or water body. The following habitat types were defined (in order of distance from the Arataye River): Arataye River, forest creeks, palm swamps, temporary flooded forest, and primary nonflooded rain forest. All were close to the Arataye River with a maximum straight-line distance of ca. 270 m from a GPS waypoint where a turtle has been found to the Arataye River. The altitude of the areas where turtles were found ranged from ca. 20–40 m above sea level. An overview of the study area is provided in Figure 1.

The Arataye River is a tributary to the Approurague River, one of the major rivers in French Guyana. It receives water from the countless forest creeks of the eastern center of French Guyana and discharges into the Atlantic Ocean. The water level is highly dependent on rainfall, and therefore season of the year with the rainy seasons lasting approximately from early December to February and from April to July. Its depth varies from less than 1 m to several meters, but the river never runs dry. There is no closed canopy above the main channel, but the shores are densely vegetated. At Camp Pararé, the riverbed consists largely of sand and gravel, with occasional rocks forming rapids. The elevation of the river is about 20 m above sea level. The following parameters were measured at the campsite during the late rainy season (mid-February): width = 30 m, temperature = 27°C, pH = 6.5, electrical conductivity = 15 µsec/cm, and carbonic hardness = 2°DH. Because of the current and input of fine particulate matter from forest creeks, visibility in the water is only up to approximately 1 m. This is even more degraded during times of high water.

Forest creeks meander through lower areas of the forest and are fed by runoff water from the hills in the reserve and drain into the Arataye River. Means of physicochemical parameters in the late rainy season ($n = 4$) are temperature = 25.2 ± 0.5°C, pH = 6.5 ± 0.2, electrical conductivity = 42 ± 14.8 µsec/cm, carbonic hardness = 1.75 ± 0.5°DH, and current velocity = 0.15 ± 0.05 m/sec. Mean depth is 35.0 ± 21.5 cm, and mean width is 3.4 ± 1.1 m. The riverbed of those streams typically consists of sand and gravel, while mud and leaves are accumulating in areas of lower stream velocity. These areas are created mostly by the strongly meandering shape of the streams and by fallen trees and logs. No subaquatic macrophytes are present, presumably due to the high fluctuation of stream velocity and water level during events of rain and subsequent flooding. The canopy above those creeks is mostly closed, leaving the water body shaded. During periods without rainfall, the water is quiet and clear with approximate visibility of 1–3 m.

The soil of palm swamps is saturated with water most of the time, and canopy cover is not always 100%. The forest floor is covered with leaves and palm branches. During flooding events and heavy rainfall, the whole swamp floor is covered with water, which is retained longer than in temporary flooded forests. Small rivulets sometimes remain permanent without rain and gain in size during rainfall. Palm swamps are often found in lower elevations of 20–25 m above sea level near the Arataye or between hills. The canopy is mostly closed, but dense vegetation occurs in patches where the sun comes through.

Temporary flooded forests show basically the same structures as nonflooded forests, but due to their flat relief, pools develop on the forest floor, and depressions are filled with water during heavy rainfall. Measured physicochemical parameters of 1 forest pool 4.7 × 3.3 m and 14.4 m in perimeter were temperature = 25.0°C, pH = 6.4, electrical conductivity = 115 µsec/cm, and carbonic hardness = 2°DH. During flooding events caused by increased rainfall and therefore rising water levels of forest creeks, the whole forest floor is covered by water.

Primary nonflooded forests covered the higher situated areas of hills at 30 m above sea level or more and often showed inclining forest floor. Canopy cover of the forest floor is mostly close to 100%, so there is no dense vegetation in the understory. The forest floor is covered with leaves. There are no permanent sources of water, and only rarely are there puddles or water-filled holes.

RESULTS

Trapping *P. platycephala* was ineffective, as no twist-necked turtles were trapped during our efforts; instead, all turtles included in this study were hand captured. In 2009, 1 female (P1) and 1 male (P2) *Platemys platycephala* were caught during trap checks (i.e., were not entrapped) and equipped with radio transmitters and stomach flushed 5 times over 2 wks. During the 2010 field season, radio tags were still working on P1 and P2, which enabled tracking of these two individuals for a second season. Two additional males (P3 and P4) were also hand caught in 2010 and equipped with radio transmitters.

All 4 turtles were adults and showed typical coloration of the nominate subspecies *Platemys platycephala platycephala* Schneider, 1792. Basic morphological data at the first point of encounter are given in Table 1. The female (P1) did not show signs of growth from 2009 to 2010, but the male specimen's (P2) carapace length (CL) increased 3 mm, plastron length (PL) increased 5 mm, and plastron width (PW) increased 1 mm. In 2009, weight was not measured; therefore, it cannot be said if and how weights changed over the year.

Total covered minimum straight distances between trackings of the 2010 field season did not vary much and ranged from 503 m (P1) to 686 m (P2), but mean covered distances between checks were quite variable among the study animals (see Table 1). Especially specimens P3 and P4 showed great variety in moved distances, with the standard deviation being nearly double the mean (P3: mean = 31 ± 74 m; P4: mean = 34 ± 61 m; Table 1). This is a result of long periods of resting in combination with far movements. For example, specimen P3 had apparently not moved during 13 consecutive trackings over a period of 7 d (11–17 February 2010) but moved straight distances of over 100 m on 3 occasions during the study, accumulating a total distance of at least 648 m. Specimen P1, which moved a mean minimum distance of 23 ± 24 m per half day, was found to be stationary on only 5 occasions, accumulating a minimum of 503 m over the study period. Comparisons of distances moved by all 4 study specimens are given in Table 1.

To see whether *P. platycephala* are moving farther during the day or during the night, as indicated by covering greater distances, 1-way ANOVA was performed on the data sets divided by movements over night and during the day. While individual comparisons showed no statistical significance (P1: $p < 0.0979$, $F_{1,19} = 3.030$; P2: $p < 0.1456$, $F_{1,17} = 2.326$; P3: $p < 0.3063$, $F_{1,15} = 1.122$; P4: $p < 0.1201$, $F_{1,12} = 2.800$), combined data divided by day and night were significantly different, suggesting that these 4 specimens were more active during the night hours ($p < 0.0028$, $F_{1,75} = 9.541$; see Table 1), recognizing that the chosen time periods actually differ somewhat between day and night.

In 2010, areas of activity were 0.73 ha (P3), 1.00 ha (P2), 1.20 ha (P4), and 1.59 ha (P1). These areas did not overlap between specimens, but the areas used in 2009 by P1 and P2 overlapped with those from 2010, the ones from 2010 being substantially larger because of the larger data set.

The 3 habitat types that were used mainly within areas of activity were primary nonflooded rain forests, temporary flooded forests, and palm swamps. Forest creeks were only rarely used, and no specimen of *P. platycephala* has been found directly along the banks or in the Arataye River. First encounters with turtles were always in aquatic habitats like palm swamps and temporary pools in the forest, where the leaf mimicry of the carapace is less inconspicuous relative to its appearance on the forest floor. During the study, specimens were concealed most of the time and were almost impossible to find without radiotelemetry equipment. They chose terrestrial resting places in mostly nonflooded and temporary flooded forests. On approach, the turtles were resting under logs or near roots, buried under the leaf litter, showing no signs of recent attempts to flee from disturbance. In aquatic habitats like forest creeks or palm swamps, the turtles were found buried in mud or under leaves, even when the water level was too high to breathe by just stretching out the neck. After first encounters, the turtles were never found uncovered again, indicating that they rarely move or rest in the open.

During the study, 10 stomach samples were flushed; diet samples were recovered from 4 individuals. Two fecal samples could be obtained as well, which were composed of unidentified plant material, berries, decapods, oligochaetes, and orthopterans. As well as unidentified plant material, stomachs contained oligochaetes, nematocerans, diplopods, cicadas, and two kinds of amphibian eggs. In 1 case, feeding was observed, when specimen P1 was found for the first time. It was sitting at the edge of a water-filled depression and had just eaten freshly laid amphibian eggs, the gelatinous mass that surrounds the eggs still sticking to its jaws.

DISCUSSION

There are documented records of 3 chelid turtle species (*Mesoclemmys gibba*, *M. nasuta*, and *Platemys platycephala*) in the Nouragues reserve (CNRS 2012a). Despite a study length of approximately 2 mo and the fact that all scientists staying at the Camp Pararé (up to 20 people) were requested to collect side-necked turtles on encounter, only 4 specimens of *P. platycephala* and 2 specimens of *M. nasuta* were found during rainy seasons, when turtles are expected to be most active. This indicates that although *P. platycephala* is a widespread species in South America, either local abundance seems to be quite low in the vicinity of Camp Pararé or the species leads a very cryptic lifestyle. Compared to other forest-dwelling chelonian species of similar size, such as Chinese box turtles (*Cuora flavomarginata*), hinge-backed tortoises (*Kinixys* sp.), and cane turtles (*Vijayachelys silvatica*), the sizes of the areas of activity of *P. platycephala* lie within the reported ranges (Lue and Chen 1999; Lawson 2006; Deepak and Vasudevan 2010). Unlike in other studies mentioned previously, the female covered the biggest area with her movements. This may be a result of small sample size because the 3 males tended to cover greater distances when they were moving, contrary to the female, which moved more continuously but in smaller steps. Thus, over a longer period of monitoring, the males might have bigger areas of activity.

Contrary to general belief and husbandry recommendations in hobbyist literature (e.g., Thieme and Thieme 1996; Buchert 2010), *P. platycephala* turned out to behave quite terrestrially. Only when encountering them for the first time or on rare occasions during the study were specimens found along stream banks or in temporary ponds, which indicates that the species enters water bodies (thereby giving up its camouflage) only for foraging and mating. When they are inactive, twist-necked turtles are nearly invisible among the leaf litter, which explains why most reported observations are made in aquatic habitats like ponds, water-filled car tracks, or puddles in the rain forest.

Even though variable habitats like palm swamps and temporary flooded forests change a lot during the course of the year, 2 *P. platycephala* occupied the same areas in the years 2009 and 2010. This indicates that maybe the actual home range of these individuals might not differ significantly from the calculated area of activity, assuming that the same habitats are also used during the dry season. None of the observed animals had overlapping areas of activity during the study period; therefore, intraspecific interactions among the study specimens during the time of the field studies were highly unlikely, although interactions with nonmarked specimens cannot be excluded in scope of their cryptic lifestyle. Specimen P4 came close to the area of activity of specimen P3 in 1 case, showing that basically the distances between the individuals are close enough for them to meet, but at this time, P3 was found in a different area.

No detailed quantifications have been performed in this study, but dietary analyses showed that *P. platycephala* do not exclusively feed on amphibian larvae and eggs. However, when present, these items made up the majority of stomach contents. Based on documented amphibian species in the reserve and on observations of breeding amphibians during the study, ingested eggs most likely belonged to a member of the *Bufo margaritifer* complex and to a microhylid frog, probably *Chiasmocleis shudikarensis* or *C. hudsoni* (W. Hödl, *pers. comm.*, May 2008).

The presence of other food items that are basically of terrestrial origin led to the question of whether they entered the water body by accident or whether the turtles not only forage in water but also return to the water for swallowing items that were captured on land (Thieme and Thieme 1996). The feeding mechanism in *P. platycephala* has not been studied in detail yet, and up-to-date reports on land-feeding chelid turtles under natural conditions were not available.

The berries and plant material found in the fecal and stomach samples looked like they were ingested incidentally, or the samples were contaminated during the stomach-flushing procedure on the forest floor rather than taken up deliberately, because they made up only a small proportion of the samples. If a fruit or a leaf were intentionally swallowed, the amount of biomass found within the sample would likely have been bigger.

In summary, the twist-necked turtle lives a largely terrestrial and solitary existence throughout most of the end of the rainy season in French Guyana, seeking out water bodies only for feeding and sometimes for resting. During periods of low to no rainfall, the study specimens were inactive, perhaps in a state of aestivation. The food spectrum includes small, easy-to-catch prey with an opportunistic preference for amphibian eggs.

This leads to further research questions: Do twist-necked turtles use the same areas throughout the whole year, or will they move to other habitat types during the dry season or at the start of the rainy season? If so, do they aggregate during times like explosive amphibian breeding events, like single observations by Dixon and Soini (1977) imply? A longer observation period could also be used to see if *P. platycephala* randomly move through the forest or if they display distinct migrations and seasonally return to certain areas that get flooded or to ponds that always emerge at the same place after strong rainfalls to feed and copulate there. A small indication of this behavior was given by specimen P3 of the study, which repeatedly entered a small artificial pool that often contained larvae of the monkey frog *Phyllomedusa tomopterna*.

Because *P. platycephala* is not currently listed in the IUCN Red List of Threatened Species, the species has received relatively little attention from scientists, and the impacts of continuous harvest for pet trade and subsistence hunting (De Souza-Mazurek et al. 2000) all over the Amazon Basin remain unclear. Further studies of fundamental aspects of this species' ecology and assessments of population status in countries that regularly export *P. platycephala* (Peru, Guyana, and Suriname) are needed.

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