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Insights into social interactions in the Ecuadorian horned anole, *Anolis proboscis*

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Certifico que la disertación de Licenciatura en Ciencias Biológicas del candidato Diego Ricardo Quirola Rodríguez ha sido concluida de conformidad con las normas establecidas; por lo tanto, puede ser presentada para la calificación correspondiente.

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Director de la disertación

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A mi familia

Insights into social interactions in the Ecuadorian horned anole, *Anolis proboscis*

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ABSTRACT

The Ecuadorian horned anole (*Anolis proboscis*) is a slow-moving cryptic species endemic to the northwestern slopes of the Andes in Ecuador. Males of this species bear a rostral appendage that has been interpreted as an exaggerated trait resulting from sexual selection. Here, we describe thoroughly possible uses of the rostral appendage of *A. proboscis* in social interactions by filming and analyzing 11 matings and three male-male trials. We describe four types of displays by males, as well as male-female courtship behavior and male-male agonistic interactions. We found that the rostral appendage is used in social displays but not as a weapon in combat. Unlike other lizards with a rostral appendage, males of *A. proboscis* are born with this structure.

INTRODUCTION

Sexual selection has resulted in numerous examples of exaggerated morphological traits. These traits are typically used in mate choice and/or intra-sexual competition (e.g. spines in stickleback fish, conspicuous plumage in birds, etc.) (Andersson 1994). In males, exaggerated secondary sexual characters may be honest indicative of individual fitness (Lailvaux and Irschick 2006; Irschick et al. 2007a; Irschick et al. 2007b; Karsten et al. 2009a) and are ultimately associated with reproductive success that will be reflected in the offspring, providing an indirect benefit for the females (Andersson 1994). For example, there are some functional correlations of exaggerated traits, such as dewlap and head size with bite force in lizards (Vanhooydonck et al. 2005a; Vanhooydonck et al. 2005b; Irschick et al. 2006; Karsten et al. 2009a). Thus, exaggerated traits may be honest signals of performance and benefit the males in intra-sexual selection, inter-sexual selection, or both (Karsten et al. 2009a).

Lizards of the genus *Anolis* have been used as model system for investigating sexually selected traits. One of them is the dewlap, an exaggerated morphological trait, consisting of an extensible flap of skin located on the throat that varies among species in size and color pattern (Losos 2009). The dewlap is used in both intra-specific and inter-specific communication (Greenberg and Noble 1944; Losos 1985; Decourcy and Jenssen 1994). Further, this structure can reflect conspicuous colors including ultraviolet wavelengths (Whiting et al. 2006). The dewlap is used in stereotyped visual displays that usually involve other body movements such as head-bobs and push-ups (Greenberg and Noble 1944; Jenssen 1977; Losos 2009; Fleishman and Pallus 2010).

Interestingly, three *Anolis* species have developed another exaggerated trait, a rostral appendage (see Williams 1979). One of them is the Ecuadorian horned anole, *Anolis proboscis*, which was long thought extinct but was recently rediscovered (Almendáriz and Vogt 2007). This

is a slow-moving cryptic species, endemic to the western slope of the Andes in northern Ecuador (Yánez-Muñoz et al. 2010; Losos et al. 2012; Poe et al. 2012). The males hatch with a small rostral appendage at the tip of the snout (Fig. 1A), which grows with age to become almost the same length as the head (Poe et al. 2012) (Fig. 1B, C). This appendage is soft, fleshy, flexible, and compressed laterally. Further, it is at least somewhat mobile (Yánez-Muñoz et al. 2010; Losos et al. 2012; Poe et al. 2012).

While the rostral appendage in *A. proboscis* has been previously described, its function and how it is used in social displays remains unclear. The presence of the rostral appendage only in males has led to the suggestion that it is a product of sexual selection (Williams 1979; Yánez-Muñoz et al. 2010; Losos et al. 2012). As such, it could be used in male-male competition, female mate choice, or both. In this note, we provide new insights on the social behavior of *Anolis proboscis* by reporting for the first time observations of how males use the rostral appendage during both agonistic and courtship encounters. Further, we provide general data on the ontogeny of this structure.

MATERIALS AND METHODS

We searched *A. proboscis* in the area surrounding the town of Mindo, Pichincha Provence, Ecuador, located at ~1,270 m of elevation on the western slopes of the Andes (exact locations withheld to avoid poaching). Upon visually locating an individual, we captured it by hand or by noosing. Each captured lizard was assigned a code that was written on its abdomen with a marker. Following the study, all individuals were released at their original capture locations. Lizards were kept in captivity for a maximum of three days. Trials were conducted

outdoors approximately 5 km away from the collecting sites. For each trial, two lizards (two males, or one male and one female) were placed on branches of an isolated tree, at an average distance of 45 cm between them. Two video cameras recorded their behavior from a distance that varied between 3 to 7 meters. Following previous observations of activity of *A. proboscis* (Losos et al. 2012), all trials were conducted between 09h00 and 12h00 from 28 February until 18 September 2014 (Tables 1 and 2). From these videos we documented the courtship and agonistic behavior of males focusing on the possible uses of the rostral appendage. Push-up displays were defined following the description suggested by Ruibal (1967), *"This motion consists of an extension of the forelimbs to raise the front part of the body off the ground ... Both bobbing and pushups may be combined with dewlaping"*. Videos were analyzed with Adobe Premiere Pro CS6 (Gogolin et al. 2012)

In order to learn more about the ontogeny of the rostral appendage in *Anolis proboscis*, we captured and housed a gravid adult female (QCAZ 12725) at Museo de Zoología QCAZ, Pontificia Universidad Católica del Ecuador in Quito. The eggs were incubated under an ambient temperature that varied from ca. 28ºC during the day to ca. 17ºC during the night, and relative humidity between 80% – 90%.

RESULTS

Eight males and five females were used in 14 behavioral trials where lizards displayed the social behaviors listed below (Tables 1, 2). 11 matings, involving five males and five females, were observed and recorded. Additionally, three male-male agonistic interactions were observed and recorded, involving six males (Table 2). Trials varied in duration from 4:09 to 8:56 minutes

for male-female interactions (Table 1), and 7:33 to 35:47 minutes for male-male interactions. All behaviors recorded are described in detail in the supplementary material.

Displays by males

Males performed four different types of displays. On the first one, which we will refer to as "Head Swinging", the male did side-to-side head movements while approaching the female; this behavior was accompanied with head rising when reaching left or right extremes. During the approach, the dewlap was extended multiple times, although sometimes it was only half-extended. This type of display was exhibited only during courtship on at least nine of 11 trails (Video 1 in Supplemental Materials).

Throughout the second type of display, referred here as Type A, the male raised his head with a push-up, moved his head down and then up; this sequence was repeated twice during a single dewlap extension (Video 1). The third type of display, named Type B, involved the same two sequences of movements as Type A, but the head movement of the first sequence was different (head up, down, down lower) (Video 1). The second and third types of displays were exhibited during both courtship and agonistic interactions. They were performed independently during the trials, with no specific order. Each display was performed in a stepwise manner and was observed on seven of 11 trails.

During the fourth display, referred here as "Agonistic" display, the male performed an undulatory, push-up like, movement (involving fore and hind limbs). This behavior started with the male raising his head, then he moved the body forward with head and tail down, next he moved the body back and lifts his head and tail. All this happens with a laterally compressed

body, extended dewlap, curled tail tip and straight proboscis (Video 1). This display was only performed at the beginning of one of the three agonistic interactions observed.

Male-female courtship behavior

We grouped mating behaviors into four steps: courting, chasing, stimulation, and copulation (see supplementary material for a complete description). In six of 11 matings all the listed behaviors were displayed in a sequential order (Table 1). In the other five matings, some of the behaviors were neither performed or observed because of incomplete videos or camera out of frame due to movement. Courting was observed on at least nine of the 11 trials; it involved head swinging and ended when the female approached the male and ran past him in the opposite direction to which the male is heading. Chasing was observed on all trials; it involved the male going after the female using short sprints, accompanied frequently by stereotyped head-bobbing like movements. Stimulation was observed on all trials; it involved straddling from the male to the female, with forelimbs, until reaching a good position for copulation. The male continuously stimulated the female by rubbing her nape with his snout tip, elevating the rostral appendage simultaneously. Additionally, biting on the nape (Fig. 1D) was observed on six out of 11 occasions after nape rubbing. Copulation involved the male opposing his cloaca to the female's and inserting one of his hemipenis. For a complete description of male-female courtship behavior see the supplementary material.

Male-male agonistic interactions

We recorded three male-male agonistic interactions. During the first two interactions, both males displayed at one another. In contrast, on the third interaction, just one of the males displayed while the other male stood still. All of the interactions included biting attempts (Fig.

1E). In the first trial, this led to a bite on the neck from one of the males to the other. On the second trial biting attempts resulted in jaw locking (Fig. 1F) and on the third, it caused the flight of the defeated male and ended the trial. Further, during the three trials proboscis lifting was performed by at least one of the males. For a complete description of agonistic behavior see the supplementary material.

Reproduction in captivity

The captive female (SVL=75.76 mm) laid multiple clutches of one egg each. On June 30 of 2014, after an incubation period of 165 days, a small male (SVL = 32.00 mm, weight = 0.6 g) hatched and became the first ever captive-born Ecuadorian horned anole (QCAZ 12867). This male hatchling (Fig. 1A) had a small rostral appendage (3.00 mm), which remained lifted (~40 degrees) for 34 days after hatching.

DISCUSSION

Several suggestions have been made around the evolution of the unusual rostral appendage in *Anolis proboscis*. As proposed, the proboscis could increase the size of the male to provide an intra-specific advantage, could also be used for species recognition or had evolved as an extra ornament to compensate the small and pale size of the dewlap but these statements haven't yet been evaluated (Losos et al. 2012). As it only occurs in males, the proboscis is most likely to be a product of intersexual selection. Further, our observations support the hypothesis that the structure is used more in male-female interactions than in male-male competition, as proposed previously by Losos et al. (2012). Similar conclusions have been drawn from studies of the Malagasy chameleons *Calumma nasutum* and *Fulcifer labordi* (Parcher 1974; Karsten et al.

2009b) which also present fleshy rostral appendages. In *C. nasutum*, this structure is used for conspecific recognition rather than fighting (Parcher 1974). We suggest that the rostral appendage of *A. proboscis* is not so important for conspecific recognition given that this species differs substantially in other morphological traits from sympatric *Anolis* (Losos et al. 2012). Moreover, Karsten et al. (2009) observed that *F. labordi* may use its rostral appendage to persuade female to copulate, performing "rostral nudges" at the mid-body flank of the female; in some cases it could switch females from copula rejection to a behavioral receptivity. Further, Karsten et al. (2009) demonstrated that the rostral appendage width was an honest predictor of mating success. Thus, similar traits of the rostral appendage in *A. proboscis* could be a cue that allows females to assess suitable mates.

Lizards of the genus *Anolis* have been the subject of numerous studies on sexual selection and sexually selected traits. In particular, their displays have received substantial attention. Perhaps the most remarkable display observed during the current study was the head swinging. It was originally described in one courtship to copulation sequence and referred as "proboscis flourishing" (Poe et al. 2012). We observed this behavior only in males that appeared interested in the female and intended to initiate copulation. Since most of the males performed this behavior during interactions with females, we suggest that it is part of the basic display pattern during courtship in *A. proboscis*. We suggest that males' head swinging could be used by females to assess the quality of the males; however, we haven't assessed female preferences and encourage future analysis to confirm this hypothesis.

Side-to-side head movements during displays, similar to head swinging, have been previously described for males of at least two other anoles species. Font & Kramer (1989) described that as part of their display repertoire, males of *A. equestris* performed a side-to-side

head movement. It consisted of two or three left and right head movements, with the tip of the snout being lowered at the end of each swing. Males of *A. bahorucoensis* have a display repertoire that includes one left or right headswing as a dynamic modifier, rather than a stereotyped side-to-side head movement (Orrell and Jenssen 1998). Interestingly, this dynamic modifier is more frequently performed during male-female (present in 97% of all displays) interactions than in male-male interactions (present in 5% of all displays) (Orrell and Jenssen 1998), suggesting that headswings are associated with courtship behavior. *A. proboscis* differs from *A. equestris* and *A. bahorucoensis* in that (1) the side-to-side head movement is performed as a stereotyped movement, rather than a modifier related to each display as in *A. bahorucoensis*; (2) as the head of *A. proboscis* reaches the end of one swing, the tip of the snout is lifted upwards along with the proboscis, rather than downwards as in *A. equestris* and (3) head movement in *A. proboscis* is performed at the beginning of courtship, rather than after the rest of the display repertory as in *A. equestris*.

From our observations it appears that males of *Anolis proboscis* avoids intense agonistic behaviors. Our study shows that the proboscis, a soft, movable and fleshy appendage (Peters and Orcés 1956; Yánez-Muñoz et al. 2010; Poe et al. 2012), is not used as a weapon during male-male interactions, as suggested previously by Losos et al. (2012). In fact, most of the time when males were fighting, the proboscis remained lifted, possibly to avoid physical damage. Some males have scars on their proboscis suggesting that it can get injured during fights. The rest of the time, the proboscis remained downwards or straight, sometimes in contact with the other male. Contrasting with other anoles, *A. proboscis* seems to be less aggressive, similar to what has been described for twig ecomorphs (Johnson et al. 2010). During male-male encounters, *A. proboscis* males are similar in behavior to *A. carolinensis* and *A. limifrons*; they extend the

dewlap with less frequency (or do not extend it at all) as they get closer to one another, presumably to prevent injuries to the dewlap (Hover and Jenssen 1976; Decourcy and Jenssen 1994). Nevertheless, few bite attempts were observed during combat and jaw locking behavior was observed in one fight. Other anole species like *A. marcanoi* and *A. carolinensis* exhibit more bite attempts including "jaw locking" (Greenberg and Noble 1944; Losos 1985; Decourcy and Jenssen 1994).

Visual communication plays a critical role in social behavior, particularly in polygynous mating systems where males compete with rivals and also use visual signals for courtship (Karsten et al. 2009b). In anoles, visual signals are diverse and usually involve stereotyped head-bobs and push-ups that can be associated with dewlap extensions or not (Greenberg and Noble 1944; Jenssen 1977; Losos 2009; Fleishman and Pallus 2010). The first studies about social behavior labeled different types of visual displays for different behavioral situations (i.e. territory defense, courtship, etc.) (Greenberg and Noble 1944; Stamps and Barlow 1973; Hover and Jenssen 1976). However, more recent works have shown that different types of visual displays can be executed in response to the same behavioral situation (Decourcy and Jenssen 1994). This seems to be the case in our trials for type A and B displays, as both displays were performed during courtship and agonistic behaviors. The agonistic display resembles the "rocking motion" display described by Losos et al. (2012) as "*the lizard raised and laterally compressed its body and rocked back and forth*", except for the coiling of the tail and its synchronized movement with the head. This back and forth body movement has been reported at least in three other *Anolis* species: *A. valencienni* (Ruibal 1967), *A. nebulosus,* and *A. heterodermus* (Jenssen 1977). For the last two species this behavior was carried out as challenge displays. Similarly, male *A. proboscis* performed this display at the beginning of the second agonistic interaction.

Some differences can be noted from previous reports of the behavior of *Anolis proboscis* (Losos et al. 2012; Poe et al. 2012). For example courtship, which has been described as a rapid and aggressive event that lasted just a few seconds prior to copulation (Poe et al. 2012) can last from a few seconds to as long as nearly 3 minutes. Further, we describe courtship including the male seizing the female by the nape in some cases. Moreover, in contrast to the displays of *Anolis proboscis* reported by Losos et al. (2012), all individuals were observed doing push-up displays in this study. Also, proboscis lifting was observed during fights; this behavior had previously been reported in a male eating a grasshopper (Losos et al. 2012) and in a single courtship to copulation sequence (Poe et al. 2012). It is clear that the rostral appendage has some level of mobility, probably musculature, and it is under voluntary control. We think that proboscis lifting before mating is performed to make biting in the nape of the female easier, as males always raise the proboscis before copulation and lower it a few seconds after copulation is initiated. It is also possible that males could raise the proboscis because the stimulation done by the male to the female is carried out with the tip of the snout (base of the proboscis).

Female displays during courtship and post-copulation are reported for the first time in this study. Additionally, we report a previously undescribed behavior for this species that occurs before mating and that we call "chasing". This behavior started when the female attempted to run away from the male. A similar behavior has been reported for *Anolis carolinensis*, and it has been suggested as a challenge for the male before mating (Greenberg and Noble 1944).

Finally, we present the first record of a male hatchling of the Ecuadorian horned anole. To our knowledge, this is the only species among reptiles with a rostral appendage known to be born with this structure. By contrast, males of the agamid lizards *Ceratophora aspera* and *C.*

stoddartii start developing their rostral appendages as juveniles (Johnston et al. 2013). Why males of *Anolis proboscis* are born with a rostral appendage remains an open question.

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SUPPLEMENTARY MATERIAL

Male-female courtship behavior

Descriptions of the four different categories observed during matings: courting, chasing, stimulation, and copulation.

During courtship, the male slowly approached the female while performing Type A and B displays. As he neared the female, he flourished the proboscis from side to side in several stereotyped head sweeps. In two courtship sequences (second and fifth matings), the female displayed with a push-up (only with forelimbs), a head-bob, and extending her dewlap, in response to the male. In the fifth mating the female's display behavior was performed three times on separate occasions (Fig. 1G). In this case, while the female's displays, the male did a series of Type A and B displays. The male's courtship display finishes when the female approaches and runs past him (sometimes over the male) in the opposite direction to which the male is heading (Video 2). In the sixth mating both lizards approach each other and the male tries to start the head swinging, but the female stops and perform a display to him. Right after, she runs to past over him and the male turns around to chase her.

Chasing starts with the male going after the female using short sprints. Each sprint consisted of one to three steps (counting the forelimbs steps as reference). During the sprint the male usually made stereotyped head-bobbing like movements, which started with the anole lowering his head before sprinting, and raising it back at the end of every sprint (Video_3). There was no dewlap extension accompanying any sprint during chasing. Sometimes, the female remained in place and waited for the male. Other times, she retreated a little farther, waited, or ran until the male reached her and initiated climbing on her tail with his forelimbs. When the

female rans, the male usually didn't perform the head movements (Table 1). Chasing ended when the female arched her neck as the male approached or started climbing her back.

Stimulation occurred once the male reached the female and he straddled her with his forelimbs until he reached a good position for copulation. Sometimes, while doing this, the male moved his head side-to-side. However, in some of the matings, the female was able to take few steps with the male on her back trying to straddle her with his forelimbs and getting a good position with his hindlimbs. During this process, the male continuously stimulated the female by rubbing her nape with his snout tip, elevating the rostral appendage simultaneously. On six occasions bites were observed (Fig. 1D) and they lasted for several seconds after copulation started (Table 1); males also lowered the proboscis after this (Video_4). The female arched her neck before copulation, as reported in other species (Greenberg and Noble 1944; Tokarz 1998; Losos 2009).

Copulation took place when the male obtained an appropriate position over the female. He then swung the hind leg nearest the female over her pelvis, brought his cloaca up to hers, and inserted one of his hemipenis (Video 4). Data for the total duration of copulations are available for only 10 of the 11 matings, which ranged from 2:28 to 6:53 minutes (Table 1). Copulation ended when the female and the male decoupled. In the fourth mating, before the copulation ended, the female tried to walk up the branch they were on. The male then seemed to try to make a couple of displays, but his dewlap got stuck between his left forelimb and the back of the female and only head-bob like movements were observed. The third copulation ended when the female saw an insect and left the male to catch it. In the fifth and sixth copulations, after uncoupling, the male did one Type B display. A more complex post-copulation interaction was

observed after the fourth mating, were the male did a series of type A and B displays, and the female responded on two occasions, with the same displays as described above.

Male-male aggressive behavior

We recorded three male-male agonistic interactions. The first one lasted 35:47 minutes, the second 07:33 minutes and the third 12:27 minutes. The three observed interactions have some significant differences in the content (besides the duration time). Therefore, we describe them separately.

In the first confrontation MIN10 started climbing a branch and MIN5 slowly chases him. MIN10 turned back resulting in physical contact, displays (Types A and B), and three biting attempts; as a result MIN10 retreated. During some displays, rostral appendage lifting was observed, mainly by MIN5. MIN10 retreated progressively while displaying an arched body position (suggesting submission) compared to MIN05, which adopted a more aggressive position including arched neck, head down, laterally compressed body and raised back. On at least 14 occasions, when they were close enough, both males brought their rostral appendages against each other's faces and performed displays with half dewlap extensions and low push-ups. After these displays the lizards remained with a creased or semi-extended dewlap. The rostral appendages were sometimes used to make physical contact including soft touches with the tip of the rostral appendages and pushes with the tip of the snout (base of the appendage) (Fig. 1H). The pushes were performed only by MIN5. Additionally, MIN10 flattened his body dorso-ventrally. MIN05 always appeared to be the dominant male. The interaction ended when MIN05 took MIN10 by the throat, with a very aggressive bite while he was initiating a display, causing MIN10 to fall off the branch (Video_5). The proboscis of MIN5 was lifted before the bite and remained elevated during it; subsequently, MIN5 flattened his body against the branch and made

slight vertical movements with the proboscis (vertical plane only). Finally, MIN05 rose to the top of the branch, perched on a leaf, and made a half dewlap extension. A total of 11 Type A and 12 Type B displays were observed executed by MIN5, whereas six Type A and nine Type B displays were counted for MIN 10.

During the second confrontation (Video_6), an additional kind of display (Agonistic display) was exhibited. This display was observed during the beginning of the interaction and was performed seven times (in a row) by MIN29 and three times (two times first and one on a separate occasion) by MIN27. In the last interaction MIN27 approached MIN29, who, after the displays, jumped away from the branch he was on and landed in front of MIN27. When this happened, both males lifted their probosces and opened their mouths as a sign of aggression. From this point until the end of the interaction, MIN29 never lowered his rostral appendage, unlike MIN27 that moved it up and down on several occasions.

When they were very close to each other, sometimes with their heads in parallel, they performed displays that included a pretty low push-up and a partially extended dewlap (half extended or less) as if they appeared to avoid exposing their throats. Occasionally, there was soft contact with the rostral appendage, which usually led to responses of mouth opening (eight times in MIN29, and two in MIN27). Tail movements, consisting of slow tail undulations similar to tail wags described by Jenssen (1970), were performed sporadically through the whole interaction. During the whole interaction, a total of one Type A and three Type B displays were performed by MIN29, as well as two Type A and two Type B displays by MIN27.

None individual retreated during this interaction, so actual aggression ensued when MIN29 opened his mouth wide, provoking MIN27 to lift his proboscis, open his mouth wide and lunge at him. This resulted in jaw locking that lasted for a couple of seconds, and ended when

MIN29 pulled MIN27 to his right and caused him to fall off the branch. After this, MIN29 kept staring down from the branch and made one Type B display with the proboscis lifted. During this trial, MIN29 generally had a more aggressive pose, with the proboscis lifted all the time, head down, an arched neck, and raised back. In contrast, MIN27 had a more submissive pose, with a more straight back, head and neck nearest to the branch and occasional proboscis lifting.

During the third agonistic interaction, both males started climbing two parallel branches stemming from the same main branch. While MIN20 stopped climbing and turned around, MIN21, which had an injured proboscis, reached the tip of his branch, turned around and flattened his body. Subsequently, MIN20 climbed down to the main branch and slowly started approaching the branch where MIN21 was. During this time, MIN21 changed his body coloration from lighter to darker shades of green and brown. Only MIN20 displayed throughout the third agonistic interaction, for a total of four type A and five type B displays. For the first two displays, MIN20 stopped, placed his body laterally and performed one Type A and one Type B displays. Contrary to the displays seen before, both started similar to the agonistic display (laterally compressed body, arched back, curled tail tip), but after the first push-up the same movements described for Type A and B displays were performed, without the rocking motion of the body. From this point until the end of the trial, MIN20 never retracted the dewlap completely. Even when taking some steps to approach the other male, the dewlap was somewhat extended. While MIN20 displayed for the third time MIN21, who was in the upper part of his branch, moved laterally to the underside part of the it and stood still while the other male displayed. At least on nine occasions, MIN20 moved slightly his proboscis (vertical plane only) before and after displaying. On eight out of nine occasions, there were tail movements similar to the ones described above, but just with the tip (except for the last two were MIN20 moved all the

tail). The trial ended when MIN20 started to display with a push-up and MIN21 ran past him, causing MIN20 to stop the display, raise his proboscis, open his mouth and attempt to bite MIN21 with a half extended dewlap.

TABLE 1. Mating behavior in *Anolis proboscis*. Duration of Courtship (COU), chasing (CHA), stimulation (STI), copulation (COP), and total time (TT) is shown in seconds. Information on bitings (BIT), copulation substrate (SUB), and hemipenis used (HEM) is also shown. Asterisks indicate cases in which the male didn't perform the characteristic head movements used in chasing. A numbered code (MIN) was assigned to each individual.

	MATING INDIVIDUALS[1]	Date of trial (2014)	COU	CHA	STI	COP	TT	BIT	SUB	HEM
1	MIN2-MIN5	28 February	154	-	-	-	-	No	Branch	Right
2	MIN2-MIN5	1 March	19	22	33	191	305	No	Leaf	Left
3	MIN2-MIN5	2 March	9	32*	28	220	332	No	Branch	Right
4	MIN12-MIN13	26 May	-	33	95	363	-	Yes	Branch	Left
5	MIN14-MIN13	26 May	47/23[2]	41	43	251	370	Yes	Branch	Right
6	MIN12-MIN13	28 May	3	23*	82	413	536	Yes	Branch	Left
7	MIN14-MIN13	29 May	11	- *	-	298	442	Yes	Araceae petiole	Right
8	MIN24-MIN21	15 September	-	-	75	251	353	No	Branch	Right
9	MIN24-MIN22	17 September	13	- *	-	148	-	No	Trunk	Right
10	MIN28-MIN27	17 September	3	14	39	183	249	Yes	Araceae petiole	Left
11	MIN28-MIN27	18 September	17	30*	76	304	433	Yes	Leaf	Right

[1]Females (left) - males (right).

[2]Courtship display was performed twice.

TABLE 2. Measurements (in mm) of male and female specimens of *Anolis proboscis* used in this study and identity of their mating and fighting partners. Proboscis length was measured from the base of the rostral scale (tip of the snout) to the tip of the appendage. Head length was measured from the tip of the snout to the anterior edge of the ear.

Individual	SVL (mm)	Proboscis Length	Head Length	Mating partners	Fighting partners and dates of trials
MIN5	68.66	17.89	22.01	MIN2	MIN10 (7 March)
MIN10	73.46	17.87	22.17	-	MIN5 (7 March)
MIN13	74.23	14.92	22.28	MIN12-MIN14	-
MIN21	72.57	15.56	21.33	MIN24	-
MIN22	62.55	14.95	17.39	MIN24	-
MIN27	68.29	18.35	18.84	MIN28	MIN29 (17 September)
MIN29	69.81	18	19.58	-	MIN27 (17 September)
MIN2	72.88	-	20.53	MIN5	-
MIN12	71.70	-	20.54	MIN13	-
MIN14	71.06	-	19.77	MIN13	-
MIN24	70.79	-	19.40	MIN21-MIN22	-
MIN28	73.35	-	20.05	MIN27	-