

# RESTING BEHAVIOUR OF PARROTS *LORICULUS GALGULUS*

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## Abstract

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This study analysed the preferences of perch size and position in the aviary in a group of 6 lorikeets (*Loriculus galgulus*). We monitored the presence of the lorikeets in four different locations in the aviary – on the original perches, floor, wire mesh and experimental perches. The perch preferences were tested using 3 identical experimental perches, each of which consisted of 5 segments differing in diameter –  $\varnothing$  1 cm (circumference = 3.14 cm),  $\varnothing$  2 cm (circumference = 6.28 cm),  $\varnothing$  3 cm (circumference = 9.42 cm),  $\varnothing$  4 cm (circumference = 12.56 cm) and  $\varnothing$  5 cm (circumference = 15.7 cm). The distance between the 3<sup>rd</sup> and 4<sup>th</sup> toe was measured in all birds (it averaged in 2.4 cm) in order to assess to what extent the birds can enclose the perch with their toes. The observation continued for 35 consecutive days in a private aviary in the group of 4 males and 2 females of the same species. The images were captured in 10-minute intervals by a video-recording device. The number of images mapping the presence of the six birds totalled in 17898. Out of this number, the lories were 10453 times indoors (out of sight) and 7445 times in the outdoor fly, which was monitored. They spent most of the time resting on the original perches (3067x) and totally ignored the floor (1x). They preferred perches (5102x) to wire mesh (2342x). All the differences were highly significant. The favourite perch diameter was 2 cm (537x) and the least popular was the perch 5 cm thick (148x); the difference was also highly significant. The analysis of the obtained data revealed that the lorikeets preferred sections A (788x) and E (600x) in the aviary, which means they spent most of the time along the walls. The differences among all the observed sections were highly significant.

Keywords: lories, lorikeets, *Loriculus galgulus*, preferential behaviour, perch

## INTRODUCTION

Lorikeets are very popular parrots, although they are rarely kept in captivity. They are renowned for their atypical behaviour which earned them the name ‘bat parrots’ in the past. Females build nests in cavities of trees and they carry the nesting material in their rump feathers, just as some agapornis do (Smrček and Smrčková, 1996). Lorikeets do not feed on seeds, instead, their diet is a mixture of juicy fruit, nectar, pollen, honey and mealworms (Reinschmidt, 2010). Their digestive system is adapted to this type of diet. They have a long, slender bill and a brush-like structure at the tip of the tongue. The shape of the tongue is adapted to

feeding on nectar and, above all, on pollen – the birds use their tongue to press the pollen into an easily ingestible form (Vašíček, 2004).

Most parrot species are diurnal. They start their search for food at dawn, which is their most active period. They rest throughout the day when it is too hot, and become active again at dusk. Before it gets dark, they retreat to their favourite shelter (Smrček and Smrčková, 1996). Lories rest and roost hanging upside down like bats (Smrček, 2010). Therefore, the aviaries should have a mesh roof (Reinschmidt, 2010).

In general, the parrots which fly a lot in the wild should have perches positioned along the walls in aviaries. However, lorikeets live in thickets and thus

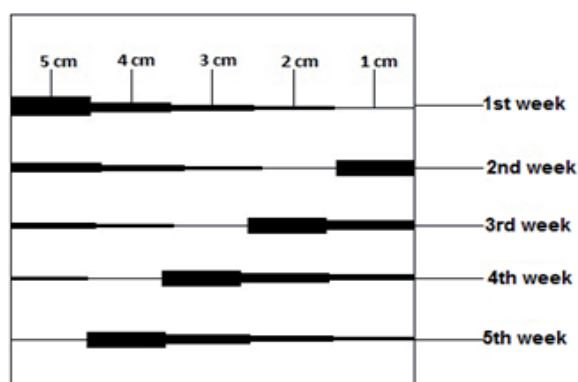
require a great number of perches in aviaries. Most keepers use natural perches, i.e. twigs and branches of fruit trees, pines, willows and various bushes. Some keepers prefer wooden poles which are more hygienic, but they deprive the birds of fun from peeling the bark off twigs (Stoodley, 2002).

The size of perch (diameter) is a subject of discussion but there has been no scientific research done into this issue. Some keepers believe that a parrot should be able to fully enclose the perch with its toes; others argue that the toes should only enclose two thirds of the circumference of the perch. Reinschmidt (2010) claims that lorries prefer thin branches.

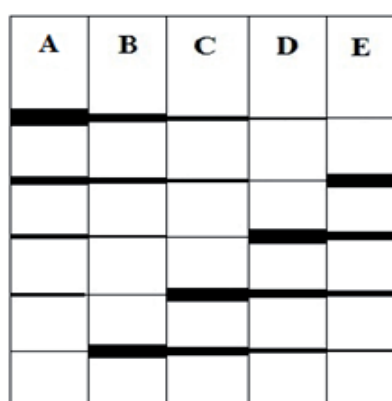
The aim of this study was to plot the resting behaviour of the parrots. We observed the site preferences of the parrots in the outdoor fly, i.e. the frequency of presence of the birds on the mesh walls, floor, original perches and experimental perches. The perch preferences were tested on the perches consisting of 5 segments of different diameters. The experimental birds were members of the species the Blue-crowned hanging parrot (*Loriculus galgulus*) and the collected data were statistically analysed.

## MATERIAL AND METHODS

The observation was carried out in the group of parrots *Loriculus galgulus*, which included 2 males and 4 females; the distance between their 3<sup>rd</sup> and 4<sup>th</sup> toes was on average 2.4 cm in order to assess to what extent the birds can enclose the perch with their toes. The birds were observed in their aviary which consisted of an indoor shelter with dimensions 2 m × 1 m × 1.8 m (h × w × l) and an outdoor fly with dimensions 2.20 m × 1.25 m × 3 m; the fly was monitored for the purpose of the study. There were 3 experimental perches in the fly, each of which consisted of 5 segments differing in diameter  $\varnothing$  1 cm (circumference = 3.14 cm),  $\varnothing$  2 cm (circumference = 6.28 cm),  $\varnothing$  3 cm (circumference = 9.42 cm),  $\varnothing$  4 cm (circumference = 12.56 cm) and  $\varnothing$  5 cm (circumference = 15.7 cm), see Fig. 1. The segments were regularly rearranged in order to test the preferred diameter. Apart from that, the preference of sections (A, B, C, D, E) in the aviary was tested, see



1: The scheme of arrangements of the perch segments



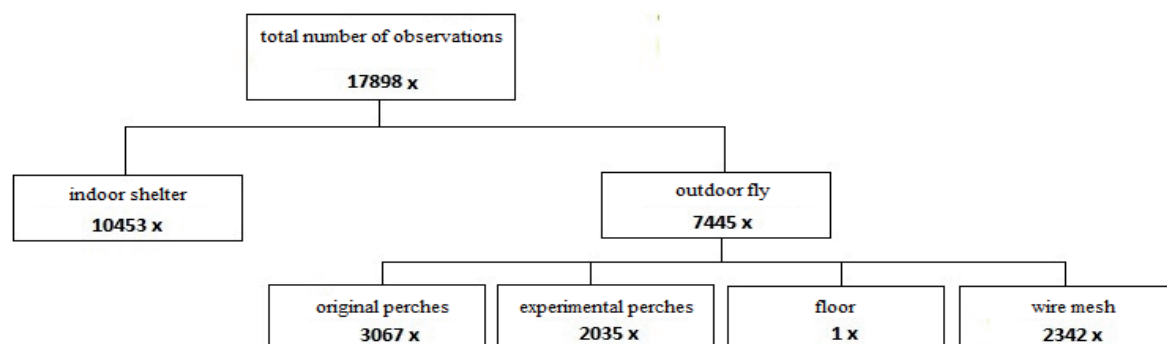
2: The scheme of sections within the aviary

Fig. 2. The sections were constant throughout the experiment.

The observation continued for 35 consecutive days in a private aviary; the images were captured in 10-minute intervals by a recording device. The number of images mapping the presence of the 6 birds totalled in 17898. The data were analysed and tested by the chi-squared distribution test.

## RESULTS AND DISCUSSION

The presence of the birds (4 males and 2 females) in the aviary was checked 17898 times. Out of this number, the lorikeets were 10453 times indoors (out of sight) and 7445 times in the outdoor fly,



3: The frequency of presence of the lorikeets in particular locations during the observation

which was monitored – they were seen resting. The Fig. 3 suggests that the lorikeets preferred original perches (3067x). The second best place to rest on was the wire mesh (2342x). The birds used the new, experimental perches 2035 times throughout the observation. They spent hardly any time on the floor where they were observed only once. The lories spent more time resting on perches (5102x altogether) than in any other observed location. The differences between the use of perches (total) and each of the observed locations were all highly significant ( $P < 0.01$ ), as Tab. I presents.

The lories obviously preferred the perches to sit on. The fact was found Mettke-Hofmann *et al.* (2004) who examined the impact of change of the environment on parrots' behaviour. They observed that the non-nomadic parrot species find it more difficult to cope with changes in the aviary and therefore do not readily use the newly installed perches. The second most frequently visited location was the wire mesh. However, there were drinkers

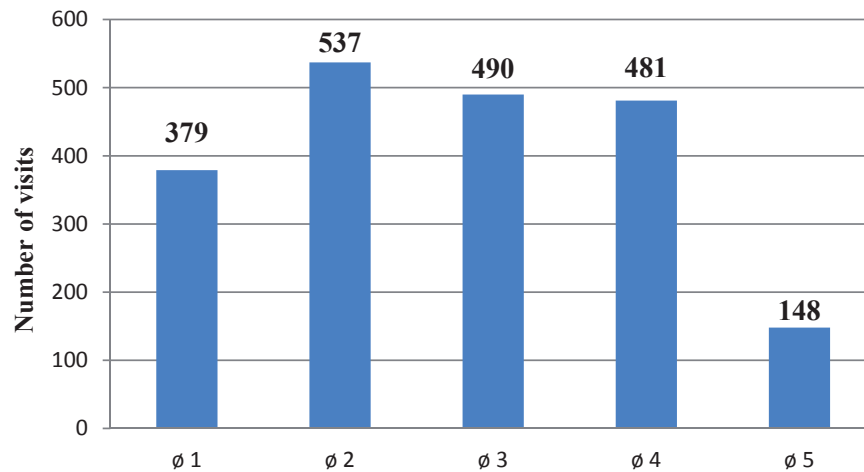
with honey water installed on the mesh which could partially explain the high frequency of visits, according to Andrýsek *et al.* (2013). Alternatively, Smrček (2010) suggested that lories favour wire mesh because they roost upside down and the wire mesh is an ideal material to hook on. The birds totally neglected the floor (used only once). This could be associated with their specific eating habits. Kalmar *et al.* (2000), Tomiška (2011) and Vašíček (2004) suggested that being nectar-eating birds, the lories have no need to pick the seeds on the ground. They only come down to the ground to collect some pieces of vegetation and grasses which they use for nest-building (Buckley, 1968).

The graph in Fig. 4 shows the frequency of use of the experimental perches differing in diameter. It is obvious that the birds preferred the perches with the diameter of 2 cm (537x), then 3 cm (490x) and 4 cm (481x). They visited the thinnest perch (1 cm) less often (379x) and they showed the least interest in the thickest perch (5 cm, 148x). The differences between

I: Significance of the differences between the use of particular locations in the aviary

|                      | Original perches | Floor | Experimental perches | Wire mesh | Perches total |
|----------------------|------------------|-------|----------------------|-----------|---------------|
| Original perches     | X                | **    | **                   | **        | **            |
| Floor                | **               | X     | **                   | **        | **            |
| Experimental perches | **               | **    | X                    | **        | **            |
| Wire mesh            | **               | **    | **                   | X         | **            |
| Perches total        | **               | **    | **                   | **        | X             |

NS ( $P > 0.05$ ); \* ( $P < 0.05$ ); \*\* ( $P < 0.01$ )

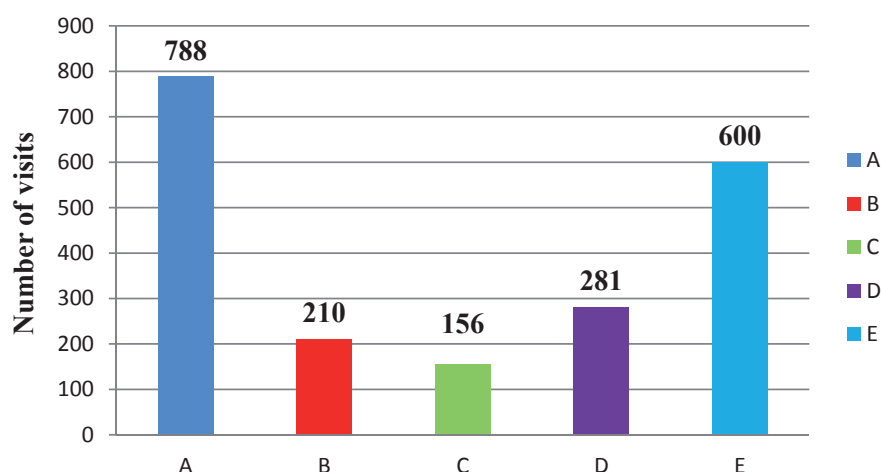


4: The use of perches with different diameter

II: Significances of the differences between the use of perches with different diameter

|   | 1  | 2  | 3  | 4  | 5  |
|---|----|----|----|----|----|
| 1 | X  | ** | ** | ** | ** |
| 2 | ** | X  | NS | NS | ** |
| 3 | ** | NS | X  | NS | ** |
| 4 | ** | NS | NS | X  | ** |
| 5 | ** | ** | ** | ** | X  |

NS ( $P > 0.05$ ); \* ( $P < 0.05$ ); \*\* ( $P < 0.01$ )



5: The presence of the parrots in the observed sections of the aviary

### III: The significance of differences between the use of different sections

|   | A  | B  | C  | D  | E  |
|---|----|----|----|----|----|
| A | X  | ** | ** | ** | ** |
| B | ** | X  | ** | ** | ** |
| C | ** | ** | X  | ** | ** |
| D | ** | ** | ** | X  | ** |
| E | ** | ** | ** | ** | X  |

NS ( $P > 0.05$ ); \* ( $P < 0.05$ ); \*\* ( $P < 0.01$ )

the frequency of use of particular perches were statistically tested and their significance is presented in Tab. II. There were highly significant differences between the thinnest perch ( $\varnothing$  1 cm) and all of the other perches ( $P < 0.01$ ), then between  $\varnothing$  2 cm and  $\varnothing$  5 cm perches ( $P < 0.01$ ),  $\varnothing$  3 cm and  $\varnothing$  5 cm perches ( $P < 0.01$ ) and  $\varnothing$  4 cm and  $\varnothing$  5 cm perches ( $P < 0.01$ ).

An appropriate diameter of the perch is vital for abrasion of claws. The optimal length of claws reduces the risk of injuries (Hansen, 1969; Ruzsler and Quisenberry, 1979; Glatz, 2002) and the risk of getting caught in the wire mesh (Tauson, 1986 and Hansen, 1976). Play behaviour (Diamod and Bond, 2003) and social behaviour (Skeate, 1985) also affect lorikeets' preferences of perch size.

It is generally thought that parrots should enclose two thirds or one half of the perch with their toes. However, our results cannot back up this general opinion because our lorikeets preferred  $\varnothing$  2 cm perches (which means the birds could only enclose two fifths with their toes),  $\varnothing$  3 cm (enclosed one quarter) and  $\varnothing$  4 cm (enclosed one fifth). Similarly, our results oppose those of Reinschmidt (2010) who claims that lorikeets favour thin branches.

The graph in Fig. 5 shows the preferences of particular sections of the outdoor fly. The lorikeets were the most frequently seen in section A (788x) and then in section E (600x). The parrots appeared 210 times in section B and 281 times in section D. Section C was the least frequently occupied (156x). Tab. III compares all the observed sections; the

differences between any two sections were highly significant ( $P < 0.01$ ).

The lorikeets were the most frequently observed along both sides of the fly, as depicted in the scheme in the Methods. The birds might have favoured these sections because they may feel safer by the walls rather than in the open space in the middle of the aviary (Lima and Dill, 1990; Sih *et al.*, 2004; Krams, 1997). Males are affected in their choice of position in the aviary by the urge to attract females' attention (Krams, 2000).

## CONCLUSIONS

Our observation of the resting behaviour of lorikeets indicated that the birds preferred the original perches and practically never used the floor to rest on. They spent more time on the perches than on the wire mesh. All these differences were highly significant.

The preference testing further revealed that the parrots favoured  $\varnothing$  2 cm perches and seldom visited  $\varnothing$  5 cm perches and this preference was highly significant. They tended to prefer  $\varnothing$  2, 3 and 4 cm perches but the differences were statistically insignificant.

The analysis of the obtained data revealed that the lorikeets preferred sections A and E of the aviary, which means they spent most of the time along the walls. The differences among all the observed sections were highly significant.

## SUMMARY

We observed the site preferences of the parrots in the outdoor fly, i.e. the frequency of presence of the birds on the mesh walls, floor, original perches and experimental perches. The perch preferences were tested on the perches consisting of 5 segments of different diameters. The experimental birds were members of the species the Blue-crowned hanging parrot (*Loriculus galgulus*). We monitored the presence of the lorikeets in four different locations in the aviary – on the original perches, floor, wire mesh and experimental perches. The perch preferences were tested using 3 identical experimental perches, each of which consisted of 5 segments differing in diameter –  $\varnothing$  1 cm (circumference = 3.14 cm),  $\varnothing$  2 cm (circumference = 6.28 cm),  $\varnothing$  3 cm (circumference = 9.42 cm),  $\varnothing$  4 cm (circumference = 12.56 cm) and  $\varnothing$  5 cm (circumference = 15.7 cm). The distance between the 3rd and 4th toe was measured in all birds (it averaged in 2.4 cm) in order to assess to what extent the birds can enclose the perch with their toes. The observation continued for 35 consecutive days in a private aviary in the group of 4 males and 2 females of the same species. The images were captured in 10-minute intervals by a video-recording device. The number of images mapping the presence of the six birds totalled in 17898. Out of this number, the lorikeets were 10453 times indoors (out of sight) and 7445 times in the outdoor fly, which was monitored. They spent most of the time resting on the original perches (3067x) and totally ignored the floor (1x). They preferred perches (5102x) to wire mesh (2342x). All the differences were highly significant. The favourite perch diameter was 2 cm (537x) and the least popular was the perch 5 cm thick (148x); the difference was also highly significant. The analysis of the obtained data revealed that the lorikeets preferred sections A (788x) and E (600x) in the aviary, which means they spent most of the time along the walls. The differences among all the observed sections were highly significant.

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## REFERENCES

- ANDRÝSEK, J., CHLÁDEK, G., JAVOROVÁ, J., VELECKÁ, M., VEČEŘA, M. a FALTA, D., 2013: Vliv denní teploty na příjem medové vody a frekvenci návštěv u napáječek papoušky *loriculus galgulus*. [CD-ROM]. In: *Animal Breeding 2013*, 14–18. ISBN 978-80-7375-666-6.
- BUCKLEY, F. G., 1968: Behaviour of the blue-crowned hanging parrot *Loriculus galgulus* with comparative notes on the vernal hanging parrot *L. vernalis*. *Ibis*, 110, 2: 145–164. DOI: 10.1111/j.1474-919X.1968.tb00438.x.
- DIAMOD, J. and BOND, A. B., 2003: A Comparative Analysis of Social Play in Birds. *Behavior*, 8/9: 1091–1115. Available from: <http://www.jstor.org/stable/4536079>.
- GLATZ, P. C., 2002: Claw Abrasives in Layer Cages – A Review. *International Journal of Poultry Science*, 1, 1: 1–5. Available from: <http://www.pjbs.org/ijps/fin2.pdf?q=claw>.
- HANSEN, R. S., 1976: Nervousness and Hysteria of Mature Female Chickens. *Poultry Science*, 55, 2: 531–543. Available from: <http://ps.fass.org/cgi/doi/10.3382/ps.0550531>.
- HANSEN, R. S., 1969: Removal of toenails stopped hysteria. *Poult. Digest*, 28: 457. ISSN 0032-5724.
- KALMAR, I. D., VAN LOON, M., BÜRKLE, M., REINSCHMIDT, M., WAUGH, D., WERQUIN, G., JANSSENS, G. P. J., 2000: Effect of dilution degree of commercial nectar and provision of fruit on food, energy and nutrient intake in two rainbow lorikeet subspecies, *Zoo Biology*, 28, 2: 98–106. ISSN 1098-2361.
- KRAMS, I., 1997: Predation risk and shifts of foraging sites in mixed willow and crested tit flocks. *J. Avian Biol.* 27: 153–156.
- KRAMS, I. 2000, Perch selection by singing chaffinches: a better view of surroundings and the risk of predation. *Behavioral Ecology*, 12, 3: 295–300. DOI: 10.1093/beheco/12.3.295.
- LIMA S. L., DILL L. M., 1990: Behavioral decisions made under the risk of predation: a review and prospectus. *Can. J. Zool.*, 68: 619–640.
- METTKE-HOFMANN, C., WINK, M., WINKLER, H., LEISLER, B. 2004: Exploration of environmental changes relates to lifestyle: a better view of surroundings and the risk of predation. *Behavioral Ecology*, 16, 1: 247–254. DOI: 10.1093/beheco/arh159.
- REINSCHMIDT, M., 2010: *Atlas papoušků: 353 druhů na fotografiích*. České Budějovice: Dona, 381 s. ISBN 978-80-7322-142-3.
- RUSZLER, P. L. and QUISENBERRY, J. H., 1979: The Effect of Declawing Two Flock Sizes of 23-Week-Old Pullets on Hysteria and Certain Production Traits. *Poultry Science*, 58, 4: 778–784. Available from: <http://ps.fass.org/cgi/doi/10.3382/ps.0580778>.
- SIH, A., BELL, A. and JOHNSON, J. CH., 2004: Behavioral syndromes: an ecological and evolutionary overview. *Trends in Ecology*, 19, 7: 372–378. DOI: 10.1016/j.tree.2004.04.009. Available from: <http://www.sciencedirect.com/science/article/pii/S0169534704001211>.
- SKEAT, S. T., 1985: Social Play Behaviour in Captive White-fronted Amazon Parrots *Amazona albifrons*. *Bird Behavior*, 6, 1: 46–48.

- SMRČEK, M. a SMRČKOVÁ, L., 1996: *Papoušci celého světa*. 1. vyd. Praha: Brázda, 220 s. Naše hoby. ISBN 80-209-0264-3.
- SMRČEK, M., 2010: Papoušci – co by měl vědět každý chovatel (2): Loriovití. *Nová Exota*, 11, 10: 12 s.
- STOODLEY, J., 2002: Amazoňan kubánský v USA. *Nová Exota*, 15: 3–6.
- TAUSON, R., 1986: Avoiding Excessive Growth of Claws in Caged Laying Hens. *Acta Agriculturae Scandinavica*, 36, 1: 95–105. Available from: <http://www.tandfonline.com/doi/abs/10.1080/00015128609435798>.
- TOMIŠKA, L., 2011: Výživa loriů. *Nová Exota*, 12, 22: 24 s.
- VÁŠÍČEK, M. 2004: *Kakaduové a Loriové*. 1. vyd. Kosmonosy: Barko, 230 s.