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The current 26 issue of Scientific Research in Zoological Parks is dedicated to different aspects of zoos activities. Traditionally we continue publishing articles on marine aquariumistics. Other articles consider problems of amphibians' breeding, hand rearing of bats and meerkats, ontogenesis of goitered gazelles. Behavioral articles are dedicated to monitoring of male Sloes bear and the spatial distribution of cranes' nests in zoo enclosure. Problem items articles consider some reptiles' veterinary problems, the review of primates' group formation methods; zoo-visitors' behaviour; sex determination in birds and wild birds biodiversity in Kiev Zoo. Special reviews discuss reptiles' cryptosporidiosis and the determinant factors of nesting behaviour of Barnacle geese. Brief reports present data on new mixed exhibitions in the "Night World" of Moscow Zoo with mammals, birds and amphibians in common enclosure. "Information" part presents data on current Combined Small Mammal and Small Carnivore TAG meeting, and on workshop concerning Prezhevskii Horse.

The issue is destined for zoo specialists, keepers and biology students.

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Summary

*D.A. Astakhov, S.Y. Poponov, V.R. Poponova. Some aspects of prolonged maintenance of marine fishes in captivity. Report 28. Genus *Dascyllus* (Actinopterygii, Perciformes, Pomacentridae, Chrominae). Data on distribution and biology of 3 species of genus *Dascyllus*: *D. aruanus* (Linnaeus, 1758), *D. melanurus* Bleeker, 1854, *D. trimaculatus* (Rüppell, 1829), and conditions of prolonged maintenance of these species at Moscow Zoo are described.*

Summary

*D.A. Astakhov, S.Y. Poponov, V.R. Poponova. Some aspects of prolonged maintenance of marine fishes in captivity. Report 29. Genus *Neopomacentrus* (Actinopterygii, Perciformes, Pomacentridae, Pomacentrinae). Data on distribution and biology of violet demoisselle *Neopomacentrus cyanomos* (Bleeker, 1856) and conditions of prolonged maintenance of this species at Moscow Zoo are described.*

Summary

*D.A. Astakhov, S.Y. Poponov, V.R. Poponova. Some aspects of prolonged maintenance of marine fishes in captivity. Report 30. Genus *Chelmon* (Actinopterygii, Perciformes, Chaetodontidae). Data on distribution and biology of beaked butterflyfish *Chelmon rostratus* (Linnaeus, 1758) and conditions of prolonged maintenance of this species at Moscow Zoo are described.*

Summary

D.A. Astakhov, S.Y. Poponov, V.R. Poponova. *Some aspects of prolonged maintenance of marine fishes in captivity. Report 31. Genus Forcipiger (Actinopterygii, Perciformes, Chaetodontidae)*. Data on distribution and biology of forcepsfish *Forcipiger flavissimus* Jordan et McGregor, 1898 and conditions of prolonged maintenance of this species at Moscow Zoo are described.

Summary

Serbinova I.A. *Breeding the nose-horned frog (Megophrys nasuta) at the Moscow zoo*. The article describes breeding, raising and feeding the nose-horned frog at the Moscow zoo. The main stages of larval and juvenile development are observed. Problems of rheophil tadpoles' growing are noticed.

Summary

E.V. Antonyouk. *Distribution of cranes' nests in captivity*. Distribution of nests of six cranes' species (*Grus leucogeranus*, *Grus japonensis*, *Grus vipio*, *Grus canadensis*, *Grus grus*, *Anthropoides virgo*) in the Rare Cranes' Breeding station (the Oka Biocphere State Nature Reserve) are briefly reviewed. According to archives data and author's observations 29,2% of cranes' pairs changed the nest site for the subsequent breeding. Others were attached to constant places and changed them seldom. Stress factors were very important as birds preferred the most quiet places in their enclosures. Siberian White Cranes' reaction on man's interference was the most pronounced. They changed the nest site for second nesting during the same season oftener than the cranes of other species.

Summary

Vakhrusheva G.V., Ilchenko O.G., Tkacheva E.Yu. *Hand-rearing Seba's short-tailed bats (Carollia perspicillata, Phyllostomidae) at the Moscow zoo*. Seba's short-tailed bats (*Carollia perspicillata*, Phyllostomidae) have been kept in Moscow zoo since 1999. During this period we had to hand-rear eight unparented young. Four of them were neonates with placentas and their hand-rearing was not successful as they refused to suck. Age of other four bats at the beginning of hand-rearing varied from 1 to 2,5 weeks and we succeeded to raise them. The start milk formula consisted of yoghurt and baby kefir (1:1) with addition (1-2 times a day) of acidophil lactobacillus "Narine" and Kinder Biovital Gel as vitamins and mineral supplement. To feed young *Carollia* we used a medicine pipette. Young were fed every 2-3 h during daytime with 7 h interval at night. One week later we used to add banana mash and when young were 1 month old – different grinded fruit. 2-month old bats received the diet of adults. They could maneuver efficiently

enough when they were flying and aged 2,5 months they were transferred to the main *Carollia* colony.

Compared with reported milk composition of *Carollia perspicillata*, our start milk formula for hand-rearing was low in potassium and nitrogen and high in calcium.

Summary

Ilchenko O.G., Morozova E., Vakhrusheva G.V. Hand-rearing meerkats (Suricata suricatta) at the Moscow zoo. In 2009 four meerkats were successfully hand-reared in Moscow zoo. The start milk formula consisted of fresh goat milk with addition of acidophil lactobacillus “Narine”. At first infants were fed 8 times a day (every 3 hours), and at the weaning when they were aged 39 days old, the number of feeds decreased to 4-5. From the age of 13 days, we added quail egg yolk and some honey to the milk formula. 3-week old young meerkats started eating insects, one week later they were eating cottage cheese as well. The article also presents the main stages of development of young meerkats. After weaning they were successfully united with the adult female and later with three adult males. Now the group consisted of 8 animals is exhibited in the Moscow zoo.

Summary

E.V. Zubchaninova, S.V. Popov. Monitoring of behaviour of Sloth-bear's (Melursus ursinus inornatus) male in the Moscow Zoo. There are results of long-term (2002-2008 years) monitoring of Sloth-bear's male behaviour during its adaptation to new zoo conditions.

The scheme of bear's outdoor enclosure is introduced at Fig.1. The ditch between the enclosure and visitors was dry and available for animal during all observation sessions except of spring, 2004 when it was full of water.

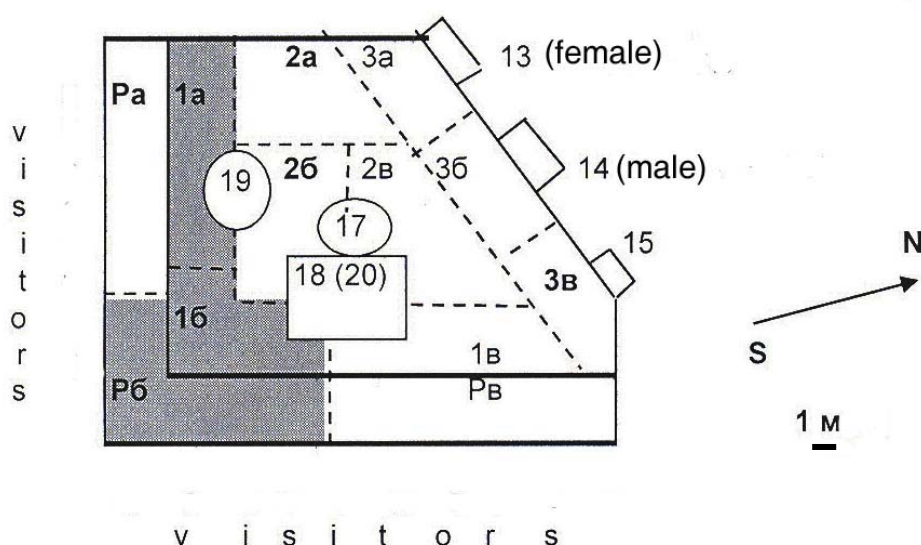


Fig. 1 The sloth-bears' enclosure (scheme)

Pa, P6, P6 – parts of the ditch; *1a, 1b, 16* – parts of zone 1; *2a, 2b, 26* – parts of zone 2; *3a, 3b, 36* – parts of zone 3; *13, 14* – tunnels-entrances to female's and male's inside cages; *15* – the niche; *17* – the trunk; *18* – the wooden deck; *19* – the water reservoir; *(20)* – the space under

the deck. Parts of enclosure that were visited by the bear more intensively are marked with grey colour.

For observation we used scan-sampling method with 30-sec. span of scan. For each scan the number of visitors nearby the enclosure, bear's location and behaviour were recorded. We marked out 22 patterns which were grouped in seven forms of behaviour. They were: 1. Immobility; 2. Normal moving; 3. Stereotypy; 4. Exploring and feeding activity; 5. Cadging from visitors and other contacts; 6. Social activity; 7. Other forms of behaviour.

The volume of observations is presented in Table 2.

Table 2. The material

№	Year	Months	Observation's number (in brackets – sum number of scans)			
			In all	Morning time	Day time	Evening time
1	2002	IX	8 (211)	4 (98)	2 (58)	2 (55)
2	2003	VIII-IX	7 (420)	2 (123)	4 (241)	1 (60)
3	2004a	VII-VIII	12 (693)	6 (336)	3 (183)	3 (174)
4	2004b	IX	8 (464)	2 (95)	3 (186)	3 (183)
5	2005	VII-VIII	19 (1112)	4 (230)	8 (486)	7 (396)
6	2006	VIII-IX	14 (865)	5 (318)	5 (298)	4 (249)
7	2007	IX-X	6 (314)	-	5 (258)	1 (56)
8	2008	IV-VI	11 (613)	4 (233)	5 (246)	2 (134)
	Sum		85 (4692)	27 (1433)	35 (1956)	23 (1307)

Zone 1 (the nearest to visitors) was obviously preferable for this animal, and there were no significant differences in other three zones' using (Fig. 2).

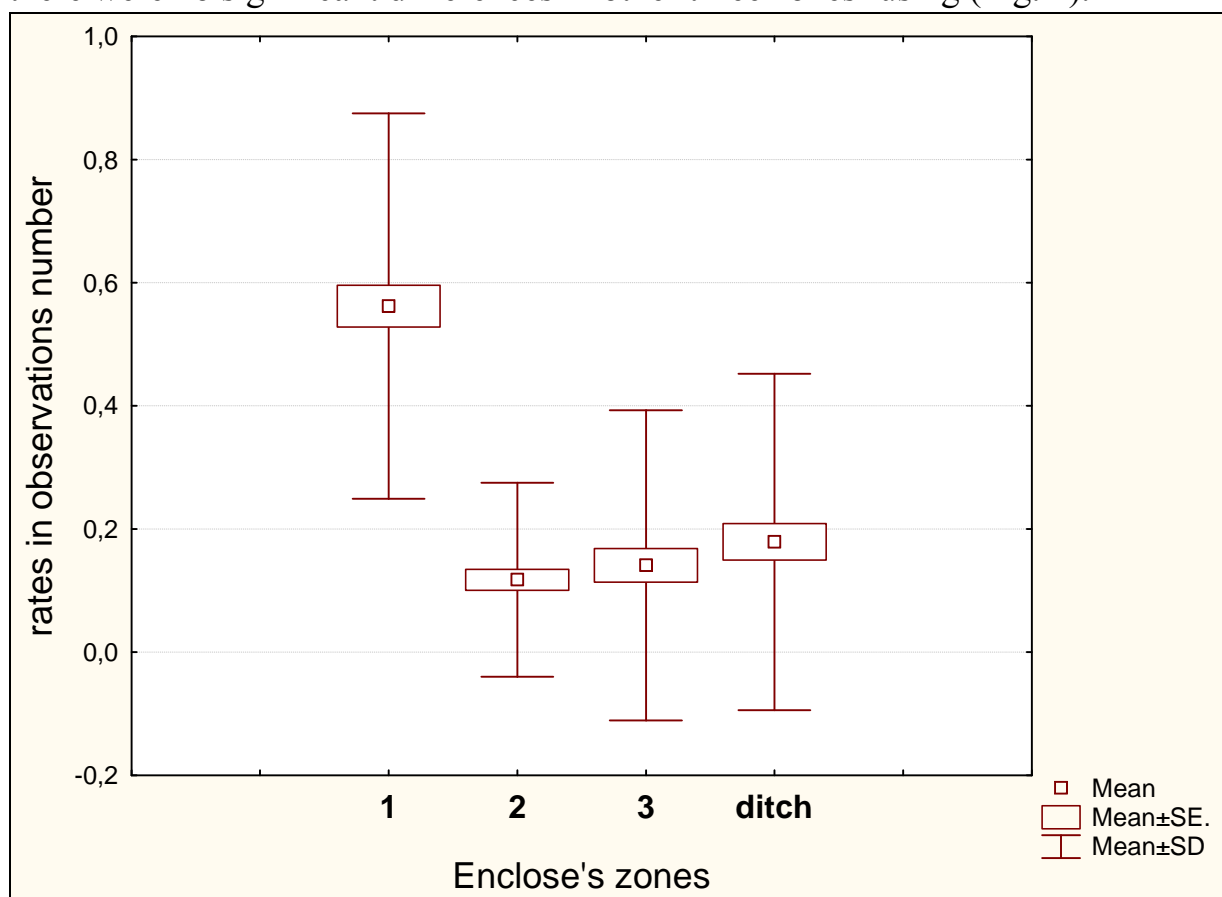


Fig. 2. Attendance of enclosure's zones by the bear (the means through all study time).

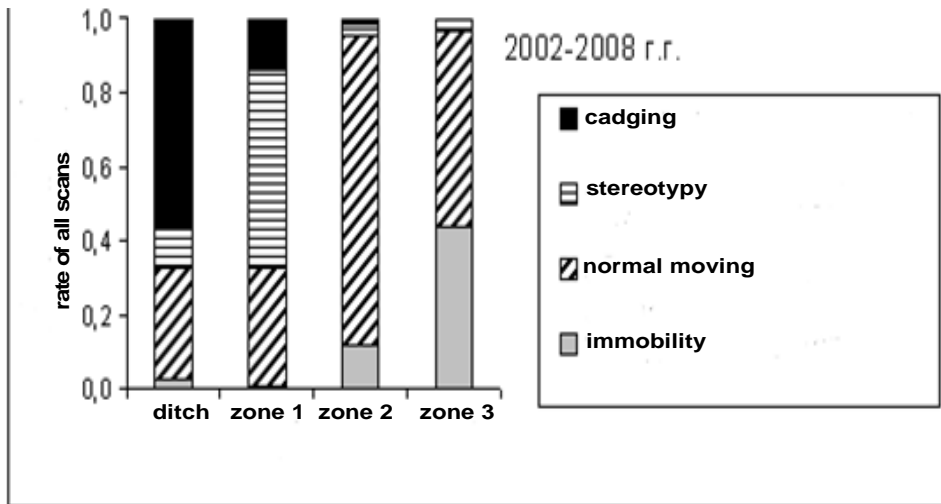


Fig. 3 Behaviour of the bear in different enclosure's zones
Number of scans: ditch – 838, zone 1 - 2721, zone 2 - 563, zone 3 – 547.

We found the bear's behaviour and its using of enclosure were closely related (Table 3). The intensity of the first zone using was correlated significantly with stereotypy and negatively associated with immobility. The using of ditch was closely related with cadging and normal moving but negatively associated with stereotypy.

Table 3. Spearman correlations for bear's occurrence in different zones of enclosure and rate of some behaviours in its time budget (All N = 85).

	Spearman	t(N-2)	p-level
Z1 & B1	-0,47	-4,86723	0,000005
Z1 & B2	-0,06	-0,58422	0,560654
Z1 & B3	0,70	9,02244	0,000000
Z1 & B5	-0,17	-1,55398	0,123995
Z1 & B6	-0,02	-0,22656	0,821321
Z2 & B1	-0,017	-0,15394	0,878029
Z2 & B2	0,37	3,61802	0,000509
Z2 & B3	0,017	0,12752	0,898834
Z2 & B5	-0,17	-1,62252	0,108485
Z2 & B6	0,43	4,31919	0,000043
Z3 & B1	0,38	3,70780	0,000376
Z3 & B2	-0,01	-0,11942	0,905233
Z3 & B3	-0,17	-1,60433	0,112439
Z3 & B5	-0,28	-2,66215	0,009322
Z3 & B6	-0,10	-0,96023	0,339729
ditch & B1	-0,15	-1,37119	0,174013
ditch & B2	0,31	2,98052	0,003775
ditch & B3	-0,36	-3,57625	0,000585
ditch & B5	0,72	9,46670	0,000000
ditch & B6	0,03	0,27464	0,784278

Z1, Z2, Z3, ditch – zones of enclosure; B1 – immobility; B2 – normal moving; B3 – stereotypy; B5 – cadging; B6 – exploring activity. Reliable indexes are marked gray

The rates of locations the bear in different zones of enclosure didn't change significantly through the years except of great decrease of zone 1 using in 2008 and increasing of zone 3 using during 2007-2008 (Fig. 4).

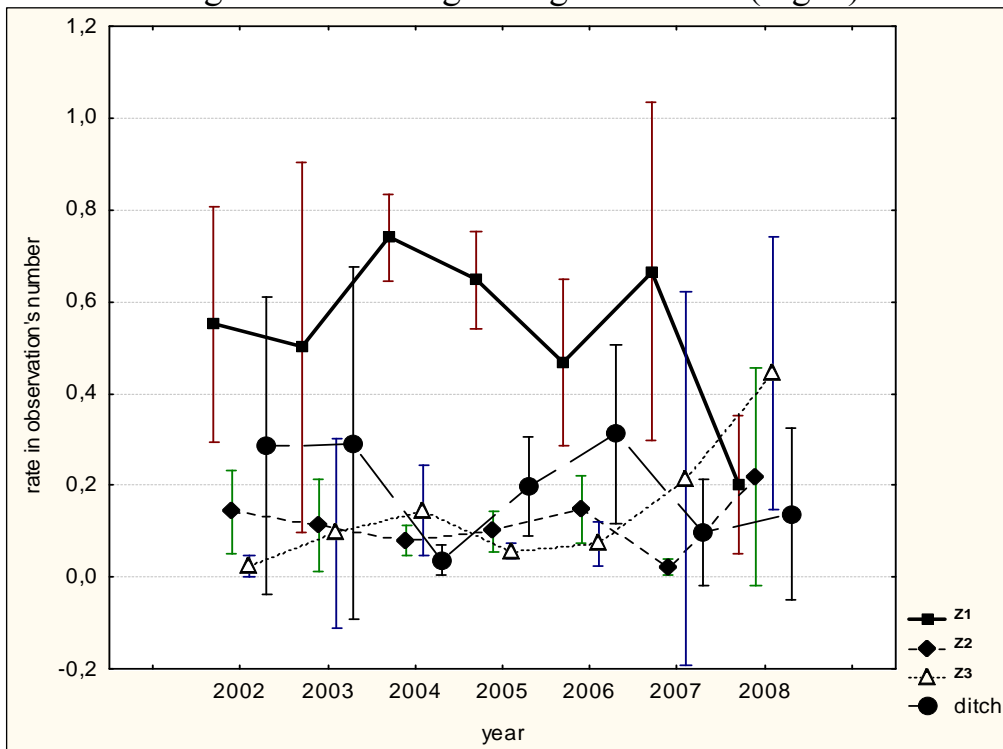


Fig. 4. Using of different enclosure' zones by the bear

The more visitors were near the bear's enclosure, the more the animal used the ditch and the less it used zone 3. Bear's using of zones 2 and 1 was independent of visitors' number (Fig. 5A).

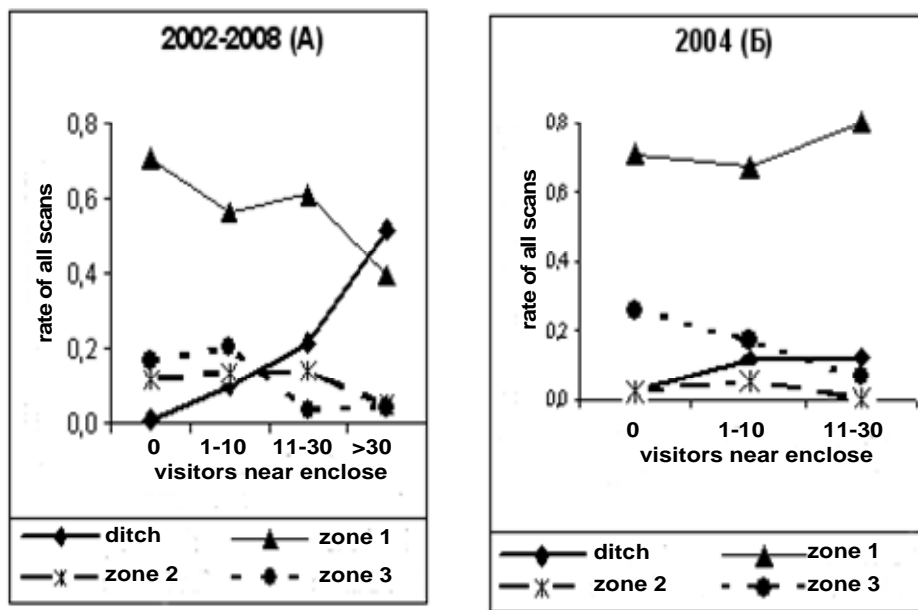


Fig. 5. Location of the bear under different number of visitors: A – 2002-2008; B – 2004 - the ditch has just released from water.

The Fig. 6 and Table 4 presents our data concerning time budget and behavioural diversity of this male bear. The rate of stereotypy increased during 2004-a (when the ditch was full of water) and 2005 (house next door was under reconstruction) (stress!). The stereotypy decreased in 2007-08 after environment enrichment.

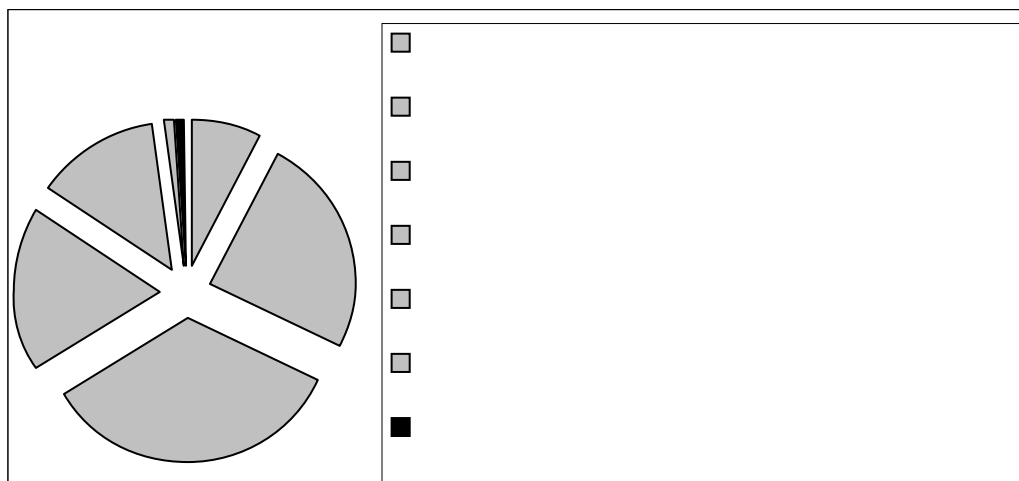


Fig.6. The time budget

Tabl. 4. The time budget and behaviour diversity (Shannon index)

Годы	Shen.ind.*	1	2	3	4	5	6	7
2002	0,657	0,00	0,23	0,34	0,28	0,15	0,00	0,00
2003	0,927	0,03	0,26	0,33	0,17	0,18	0,02	0,01
2004a	0,592	0,01	0,20	0,55	0,07	0,12	0,00	0,05
2004б	0,807	0,06	0,25	0,36	0,15	0,15	0,02	0,01
2005	0,715	0,00	0,25	0,42	0,21	0,11	0,01	0,00
2006	0,863	0,05	0,30	0,38	0,14	0,13	0,00	0,00
2007	0,731	0,02	0,28	0,14	0,48	0,06	0,02	0,00
2008	0,922	0,38	0,16	0,04	0,19	0,22	0,01	0,00

*Shannon' index – behaviour diversity

1 - immobility, 2- normal movement, 3 - stereotypy, 4 - cadging, 5 - exploring behaviour, 6 - social activity, 7 - “out of enclosure” reactions.

The more bear cadged the less rate of stereotypy in its time budget was. Such relation was noted every year (Fig. 7) and this relation became high significant (Rsp = -0,41, p=0,000096) (Fig. 8).

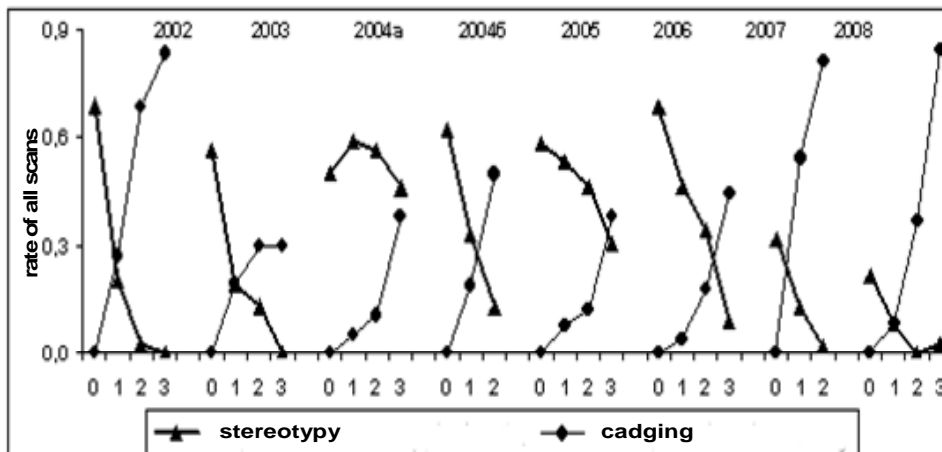


Fig. 7. Bear's cadging and stereotypy under different visitors' number
X: 0- lack of visitors, 1 - 1-10 visit., 2 -11-30 visit., 3- more than 30 visitors.

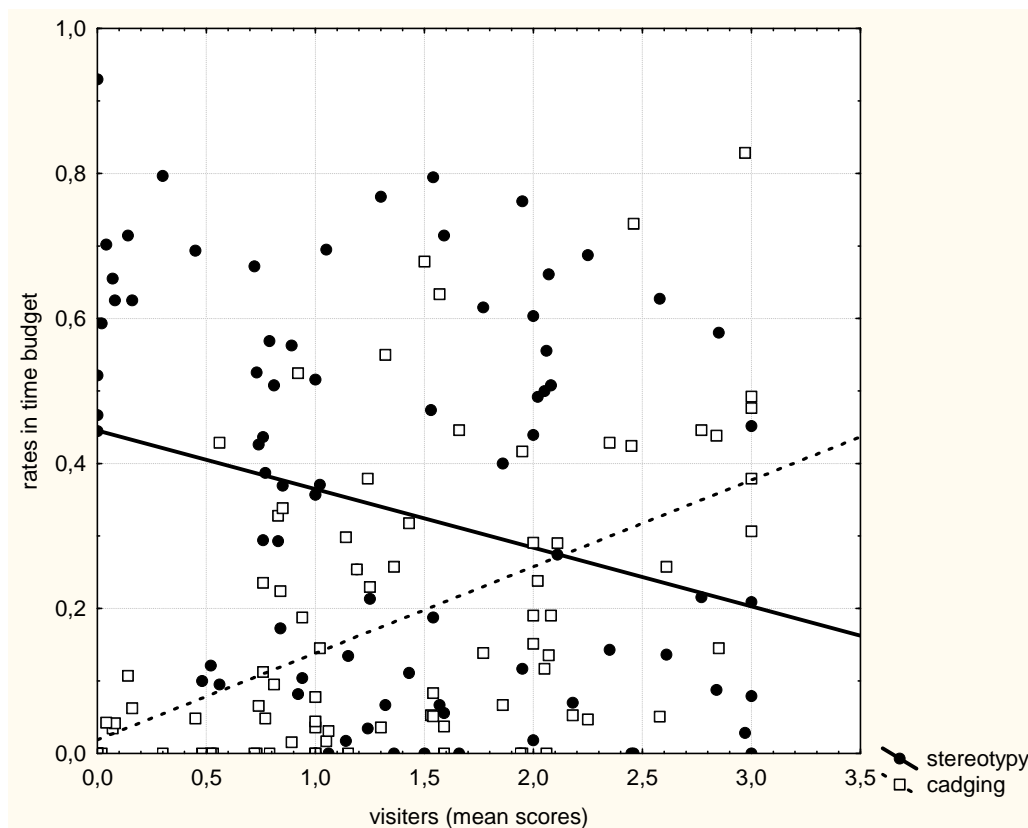


Fig. 8. The rates of stereotypy and cadging in bear's time budget depending on visitors' number nearby its enclosure.

During our monitoring period the rate of stereotypy in bear's time budget decreased and animal's behaviour diversity increased, so we concluded that its adaptation to captive conditions was successful. Our another conclusion was that cadging and stereotypy could be different ways to increase animal's control of environment.

Summary

*Soldatova N., Juldashv E., Volodin I., Volodina E., Efremova K., Lapshina E. Keeping, raising and body mass dynamics of the goitred gazelle calves (*Gazella subgutturosa*) in captivity.* The goitred gazelle is a rare species whose population number was strongly decreased in the XX century. Transportation of wild-born adult gazelles is not possible because of great fearfulness of these animals toward people and captive environment. A single way of transferring gazelles to another zoos, breeding centers and reserves is to capture the calves soon after birth and to raise them in captivity. Here we provide an essential review of methods of artificial nursing and raising the goitred gazelle calves up to adolescence, on the base of 30-year experience of Ecocenter "Djeiran". Also, we describe in detail the body mass dynamics from births to 6 months of age in male and female calves of the goitred gazelle and discuss our data with published data obtained in the wild and in captivity.

Summary

Vasiliev D.B. Palliative retrocoelomic nephrectomy in tortoises. Techniques of a transcarapacial access in surgery of tortoises of the *Testudo* genus as well as nephrectomy methods are described. Pathogenesis and postsurgical therapy of unilateral nephromegaly in tortoises as well as postsurgical changes in blood profile are discussed.

Summary

Nesterenko O.N. Could parents have an influence on sex ratio in birds? The modern molecular sexing techniques has led to increase in the number of studies that report biased offsprings sex ratio in birds. Although sex specific mortality could be a cause of biased sex ratios in some these data but other data demonstrated biased primary sex ratios according to the food available. These effects are explained owing to hypothesis of adaptive sexual investment by Trivers & Willard (1973). They predicted that when parents have few resources available, they should then bias their offsprings's sex ratio towards the sex with lower variance in reproductive success, but when resource levels are higher, they should bias it towards the sex with higher variance. It was proved for some species. For example manipulation of female pre-breeding weight of kakapo and supplementary feeding to increase the proportion of female young produced. It was proved for wild zebra finches when food availability was restricted, clutch sex ratios were significantly more male biased than when food available in excess. But experimental works and laboratory studies on sex allocation in birds are scarce.

Summary

Ocheretnyy D.H. Ornithofauna of the Kiev zoo. Data on the Kiev zoo bird population in 2008-2009 are cited. 52 free living species were fixed, 27 of them were nesting. According to author's registrations, synanthropic species were most numerous (68,2%). Comparison of the zoo bird population with that of the adjacent parks is made. It is emphasized that number of birds and their diversity could be increased through phytocenosis enrichment. First migrant birds were noted in the zoo at the end of March. The most intensive migration was timed to the second half of April and came to the end in the beginning of May. Wintering birds stayed in the zoo till the beginning of April.

Summary

Borisova P.B., Zakharchenko D.A., Volkova P.A. Reaction of the visitors of Moscow Zoo on animals depending on age and sex of visitors and on species of the animal in cage. We studied dependence of behavior of Moscow Zoo visitors on their age and sex and also on species of animal in the cage. Behavior of 982 people near cages with 8 animal species from different ecological and taxonomical groups was analyzed. The visitors' behavior did not depend on their age. The only intersexual difference was that men teased animals more frequently than women did. Visitors' behavior depended weakly on the animal's species. It seems to be more determined by the animal's activity and also by particularities of the construction and location of the cage. Visitors' behavior in working days and in the weekends differed weakly, with the exception of calm behavior which was more frequent in working days.

Summary

Meshik V.A. Approach to primates pair- and group-formation in captivity. For pair- and group-formation we used method based on using individual psychological differences, such as different degrees of reactivity of the nervous system. The procedure of group reformation consisted of temporary group destruction, introducing of a new animal to the part of the group, and then reconstruction of the whole group. Objects of environmental enrichment were successfully used during introducing animals to each other.

Summary

Vasiliev D.B., Sharova A.O. Morphometric polymorphism of cryptosporidial oocysts, isolated from various captive reptile species. Morphometric characteristics of oocysts of *Cryptosporidium* spp., isolated from 20 different captive reptile species are compared. Isolates can be reliably separated into 3 groups: *Cryptosporidium serpentis* (in snakes), *Cr. saurophilum* (in lizards, turtles) and *Cr. sp.* which is characterized by smaller dimensions and lesser form index.

Summary

Tarkhanova M.A. Factors affecting the start of incubation period in Barnacle geese, Branta leucopsis at the Moscow Zoo. We examined breeding behavior of individually marked Barnacle geese at the Moscow Zoo. The start of the incubation period over years was inferred from variations in temperature recorded. But there are many other factors which can influence the time of the nesting season: female's age and experience, individual female's or male's style, life history of the bird (for example, changing of the partner or nesting territory). The influence of the internal factors may even overlap the influence of the weather parameters. The first-time nesting females usually begin the incubation earlier during their first year than during the next years. The number of the Barnacle geese females nesting in the Moscow Zoo increases and they occupy new territories, but the synchronism of their breeding decreases, so the egg-laying period of all females becomes longer.

Summary

O.G. Ilchenko, E.P. Kuz'micheva. Animals of different classes in new mixed exhibits of the Moscow zoo "Night World". The article describes new mixed exhibits of the Moscow zoo "Night World" which consist of small mammals, birds and amphibians. Special attention is given to difficulties of such groups formation process.

Summary

Zharkikh T.L. The workshop on the A-line Przewalski horse. The workshop on the A-line Przewalski horse was held at Münchener Tierpark Hellabrunn (Germany) on May 18, 2009. Eight participants including 7 persons from Germany (Münchener Tierpark Hellabrunn, Zoological Society of the Conservation of Species and Populations, Nationalpark Bayerischer Wald, Naturschutzgebiet Tennenloher Forst, and Süddeutsche Zeitung), and one person from Ukraine (Askania Nova Zoo) attended the workshop. Unfortunately, representatives from Tiergarten Nürnberg and Tierpark Cottbus could not arrive due to circumstances beyond their control. Four reports were listened during the workshop. Wolfgang Frey (Zoological Society of the Conservation of Species and Populations) introduced the article "The A-line Przewalski horse" by Prof. Dr. Colin Groves. Prof. Dr. H. Wiesner, director of Tierpark Hellabrunn, told about new semi-reserves for the A-line in Germany. Also, a brief report about the project at the National Park Altyn Emel (Kazakhstan) was presented. W. Frey reported about the current situation with the A-line in the USA. Tatjana Zharkikh (Askania Nova Zoo) gave a report about some potential sites for re-introduction of the A-line in Central Asia. Participants discussed some details of the strategy for the

Conservation Breeding Programme for the A-Line Przewalski Horse (CBPAPH) for the future. A co-operation between the EEP and the CBPAPH should be established. Exchanges with Przewalski horses between the members of the CBPAPH were considered.

Summary

Vakhrusheva G.V., O.G. Ilchenko, S.V. Popov. Regular EAZA Combined Small Mammal and Small Carnivore TAG meeting (Hungary, 2010). In April, 2010 the current EAZA Combined Small Mammal and Small Carnivore TAG meeting was held in the Sosto zoo, Hungary. During its work different aspects of captive keeping and breeding rare, endangered and poor studied small mammal and small carnivore species have been discussed. Presentations of the Moscow zoo specialists were devoted to peculiarities of piebald shrews captive breeding and comparative sociality of four small marsupial species. The article gives a short survey of main reports as well as state and perspectives of the Sosto zoo development which may be considered as one of the most upcoming Hungarian zoos nowadays.

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