The investigations concerning an evaluation the great apes exhibits in selected European zoological gardens

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Abstract: *The investigations concerning an evaluation the great apes exhibits in selected European zoological gardens*. This paper is continuation of authors' previous work (Zubkowicz, Kaleta 2004) in which the method of the study was elaborated. The comparison of great ape exhibits in eleven leading European zoological gardens was done. Four categories of assessment (with special point system) was used to this end. Ranking showed that the best exhibits turned out to be Cologne ZOO and Munster ZOO, the worst-exhibits in London ZOO. Animal behaviour was the category with generally lower scores and it was particularly visible in the case of gorilla. In the paper suggestions concerning the method in future investigations were also made.

Key words: great ape, ZOO exhibit, evaluation, behaviour.

INTRODUCTION

This is the continuation of previous study (Zubkowicz, Kaleta 2004) in which the aim and method were described. In short, the authors' purpose was to compare great ape exhibits of leading 11 European zoological gardens. All great ape species were included: chimpanzee (*Pan troglodytes*), bonobo (*Pan paniscus*), gorilla (*Gorilla gorilla*) and orangutan (*Pan pygmaeus*), The data was obtained "in situ" via observation, documentation study (Internet was also used) and interview with curator and/or caretaker. The observations and evaluation took place in July–August 2002 and 2003. Four main categories of exhibit assessment were taken into account: animal behaviour (AB), exhibits organization and furnishing (OF), mangement (MA) and microclimate (MC). Each category comprised five factors with the exception of MA (three factors).

These factors are mentioned in Tables 1–3. Four points ranking system (from "0" to "3") in case of each factor was elaborated.

RESULTS

The evaluation of great ape exhibits is shown in Tables 1–3. Only three zoos (Cologne, Frankfurt and Wuppertal) kept four species, including the rarest and greatly endangered bonobo (*Pan paniscus*). Nine zoological gardens had three species (chimpanzee, gorilla and orangutan). ZOO in Hamburg had only one species (orangutan).

TABLE 1. The evaluation of chimpanzee and bonobo exhibits in zoological gardens (points)

| Category | Factor | ZOO-City | | | | | | | | | |
| | | * bonobo exhibit | | | | | | | | | |
		Antwerp	Basel	Berlin	Cologne *	Frankfurt am Main *	Hanover	London	Münster	Wrocław	Wuppertal *
AB	A. Social behaviour	3	3	1	1	2	2	1	3	1	2
	B. Agonistic behaviour	1	3	1	1	1	3	2	2	1	2
	C. Reproduction	2	2	1	1	1	0	1	2	0	2
	D. Maternal behaviour	1	3	1	1	1	1	2	3	1	2
	E. Stereotyped behaviour	0	2	2	1	2	2	1	3	1	2
	Total AB	**7**	**13**	**6**	**5**	**7**	**8**	**7**	**13**	**4**	**10**
OF	F. Area	0	2	3	3	1	3	1	3	2	0
	G. Furnishing with various objects	3	2	3	3	3	2	2	3	2	2
	H. Fence	3	1	3	3	1	3	0	3	2	2
	I. Vegetation	0	1	2	3	0	2	1	3	2	0
	J. Substrate and landscape	1	2	2	3	1	2	1	3	1	0
	Total OF	**7**	**8**	**13**	**15**	**6**	**12**	**5**	**15**	**9**	**3**
MA	K. Exhibition setting	1	1	3	3	1	2	1	3	1	1
	L. Possibility of rearrangement	1	2	2	3	1	2	1	3	1	2
	M. Feeding	3	2	3	3	3	2	2	3	2	2
	Total MA	**5**	**5**	**8**	**9**	**5**	**6**	**4**	**9**	**4**	**5**
MC	N. Heating	3	3	3	3	2	3	1	3	2	3
	O. Ventilation	2	2	3	3	1	3	0	3	1	2
	P. Light	2	2	3	3	1	2	1	3	1	3
	R. Humidity	2	2	3	3	0	2	0	3	1	2
	S. Exposure	2	2	2	3	1	3	1	3	2	2
	Total MC	**11**	**11**	**14**	**15**	**5**	**13**	**3**	**15**	**7**	**12**
Total:		**30**	**37**	**41**	**44**	**23**	**39**	**19**	**52**	**24**	**30**

The evaluation results are summarized in Table 4 as a ranking of scores. Using the present system the best exposition turned out to be orangutan exhibit in Cologne ZOO, the worst-orangutan enclosure in Wrocław ZOO. Cologne Zoo was a leader as concerns great ape exhibits with also the best orangutan and bonobo exhibits. Slightly lower position occupied Munster ZOO with the best chimpanzee (*Pan troglodytes*) exhibit and also very good enclosure for the gorilla. This enclosures were well managed and gave the animals wide opportunity for varied behaviour. On the other hand, London ZOO brought up the rear with its chimpanzee and gorilla exhibits.

These results were rather in line with authors' expectation. German exhibits for great apes were always ranking high in specialists whereas London ZOO is very old institution

confronted with financial and the other problems It had rather old-fashioned enclosures (Kaumanns 2002, Kisling 2001).

TABLE 2. The evaluation of gorilla exhibits in zoological gardens (points)

Category	Factor	ZOO-City								
		Antwerp	Basel	Berlin	Cologne *	Frankfurt am Main *	Hanover	London	Münster	Wuppertal *
AB	A. Social behaviour	0	3	1	2	2	1	1	0	1
	B. Agonistic behaviour	3	2	1	3	2	1	0	2	2
	C. Reproduction	0	2	1	2	1	3	0	1	0
	D. Maternal behaviour	0	2	2	3	2	2	0	2	0
	E. Stereotyped behaviour	3	3	2	3	2	1	1	3	2
	Total AB	**6**	**12**	**7**	**13**	**9**	**8**	**2**	**8**	**5**
OF	F. Area	3	1	3	3	2	3	2	3	1
	G. Furnishing with various objects	3	2	3	3	3	3	2	3	2
	H. Fence	2	2	3	3	3	3	0	3	2
	I. Vegetation	2	0	2	3	2	3	1	3	0
	J. Substrate and landscape	1	0	2	3	3	3	1	3	0
	Total OF	**11**	**5**	**13**	**15**	**13**	**15**	**6**	**15**	**5**
MA	K. Exhibition setting	2	1	3	3	3	3	0	3	1
	L. Possibility of rearrangement	2	2	3	3	2	3	1	3	2
	M. Feeding	3	2	2	3	2	3	1	3	2
	Total MA	**7**	**5**	**8**	**9**	**7**	**9**	**2**	**9**	**5**
MC	N. Heating	3	3	3	3	2	3	1	3	3
	O. Ventilation	2	2	3	3	3	3	0	3	2
	P. Light	2	2	3	3	2	2	2	3	2
	R. Humidity	2	2	3	3	1	3	1	3	2
	S. Exposure	2	2	3	3	2	3	2	3	2
	Total MC	**11**	**11**	**15**	**15**	**10**	**14**	**6**	**15**	**12**
Total:		**35**	**33**	**43**	**52**	**39**	**46**	**16**	**47**	**27**

To show the impact of categories more closely the division of total sum of points into categories was analysed in leading zoos and those falling behind. This is shown in Table 5. In this table the ideal pattern of maximum gain from various categories is shown. It may be seen than orangutan exhibit in Cologne ZOO also nearly perfectly fit into this pattern. It means that this exhibit got nearly maximum number of points from all categories. Analyzing other good zoos the striking fact may be discerned that the points for "Animal Behaviour" category were always below optimum Hence, observating animals it seems that the behaviour of apes was not as proper as may be expected on the basis of total good results in evaluation. Particularly this was evident in the case of bonobo exposition in Cologne and orangutan exhibit in

Munster ZOO. Of course, the pattern of score division into categories was considrably deviated in the case of the worst exhibits.

TABLE 3. The evaluation of orangutan exhibits (points)

Category	Factor	ZOO-City									
		* bonobo exhibit									
		Antwerp	Basel	Berlin	Cologne *	Frankfurt am Main *	Hanover	London	Münster	Wrocław	Wuppertal *
AB	A. Social behaviour	0	1	1	3	1	3	0	1	0	1
	B. Agonistic behaviour	1	3	1	3	2	3	1	2	3	2
	C. Reproduction	1	2	1	2	1	3	0	1	0	1
	D. Maternal behaviour	0	1	2	3	1	3	0	1	0	1
	E. Stereotyped behaviour	2	2	2	3	2	3	3	2	0	2
	Total AB	**4**	**9**	**7**	**14**	**7**	**15**	**4**	**7**	**3**	**7**
OF	F. Area	2	1	3	3	1	0	3	3	0	3
	G. Furnishing with various objects	3	2	3	3	2	3	2	3	1	3
	H. Fence	2	1	3	3	1	0	3	3	0	2
	I. Vegetation	0	0	2	3	1	0	2	3	0	2
	J. Substrate and landscape	0	0	2	3	1	1	2	3	0	2
	Total OF	**7**	**4**	**13**	**15**	**6**	**4**	**12**	**15**	**1**	**12**
MA	K. Exhibition setting	3	1	3	3	1	1	2	3	0	2
	L. Possibility of rearrangement	2	2	3	3	1	1	2	3	0	3
	M. Feeding	3	2	2	3	1	2	2	3	0	2
	Total MA	**8**	**5**	**8**	**9**	**3**	**4**	**6**	**9**	**0**	**7**
MC	N. Heating	3	3	3	3	2	1	3	3	1	3
	O. Ventilation	2	2	3	3	1	1	2	3	1	3
	P. Light	2	2	3	3	2	1	2	3	0	3
	R. Humidity	2	2	3	3	0	0	1	3	0	3
	S. Exposure	2	2	3	3	1	0	2	3	0	3
	Total MC	**11**	**11**	**15**	**15**	**6**	**3**	**10**	**15**	**2**	**15**
Total:		**30**	**29**	**43**	**53**	**22**	**26**	**32**	**46**	**6**	**41**

There was also possible to compare particular great ape species on the basis of evaluated expositions. In Table 6 the total number of points obtained by particular species exhibits was shown. In this case greater difference may be seen in "Animal Behavior" category between gorilla at one side and chimpanzees and orangutan at another. For example, gorilla behaviour was scored lower than chimpanzees in nearly all factors belonging to "Animal Behaviour" (see Tables 1 and 2). Remembering that the period of observations of behaviour was short the comment should be added. The troubles with gorilla in captivity are well known. Its keeping

and husbandry are difficult Even the gorilla reaction to enrichment techniques seems to be problematic (Hemphill, McGrew 1998).

TABELA 4. The ranking of scores obtained by the best and the worst exhibits as % of maximum value (54)

ZOO-Exhibit	Total score	5 of maximum score no of
The best exhibit		
Cologne - orangutan	53	98
Münster - chimpanzee	52	96
Cologne - gorilla	52	96
Münster - gorilla	47	87
Münster - orangutan	46	85
Cologne - bonobo	44	81
The worst exhibit		
London - chimpanzee	35	35
London - gorilla	30	30
Wrocław - orangutan	6	11

TABELA 5. The per cent of points gained by the best and the worst exhibits in categories

ZOO-Exhibit	AB	OF	MA	MC
Theoretical division if max.	28	28	16	28
The best exhibit				
Münster - chimpanzee	25	29	17	29
Cologne - bonobo	11	34	21	34
Cologne - gorilla	25	29	17	29
Münster - gorilla	17	32	19	32
Cologne - orangutan	27	28	17	28
Münster - orangutan	15	33	19	33
The worst exhibit				
London - chimpanzee	37	26	21	16
London - gorilla	12	38	12	38
Wrocław - orangutan	50	17	0	33

TABELE 6. The comparison of total scores obtained by great ape species

Species	AB	OF	MA	MC
Total points per species				
Chimpanzee (both species)	80	93	60	106
Gorilla	70	98	61	109
Orangutan	77	89	59	103

The difference also took place in category "Exhibit Organization and Furnishing". In this case the orangutan exhibits seemed to be somehow poorer than the others. Undoubtedly very low score obtained by Wrocław ZOO Basel and Hamburg biased this result.

The above-mentioned results suffer from obvious drawbacks the authors are aware of. The period of observations and evaluation was short and investigations may be seen as somewhat superficial. Perhaps it was also worth to to consider attributing various weights to particular categories drawback should be eliminated in further investigations.

CONCLUSIONS

1. The evaluation of selected European zoos exhibits for gear apes showed that the scores greatly varied in all categories of evaluation.
2. Cologne ZOO was ranked as the best in the case of nearly all species, the Munster ZOO may be ranked as a second.
3. Animal behaviour was the category of evaluation in which visible differences were ascertained both in comparison of zoological gardens and species of great apes.
4. The future comparison of apes (or other animals) exhibits in zoological gardens should be based on more refined techniques of observation of behaviour and better scoring system.

REFERENCES

HEMPHILL J., McGREW W. 1998: Environmental enrichment thwarted: Food accessability and activity levels in captive western lowland gorilla (Gorilla gorilla gorilla). Der Zoologische Garten 68, 381–394.

KAUMANNS W. 2002: Primatenhaltung in Kolner ZOO. Zeitschrift des Kolner ZOO, 45,3, 103–115.

KISLING V. (ed.) 2001: ZOO and Aquarium History. Ancient Animal Collection to Zoological Gardens. CRC Press, Boca Raton, London, New York, Washington.

ZUBKOWICZ R., KALETA T. 2004: An attempt to evaluate great apes exhibits in selected European zoological gardens-elaboration of method. Annals of Warsaw Agricultural University, Animal Science 42, 9–15.

Streszczenie: *Badania dotyczące oceny ekspozycji dla małp człekokształtnych w wybranych europejskich ogrodach zoologicznych*. Niniejszy artykuł jest kontynuacją poprzedniej pracy autorów (Zubkowicz, Kaleta 2004), w której wypracowana została metoda badań. Dokonano porównania ekspozycji małp człekokształtnych w jedenastu czołowych, europejskich ogrodach zoologicznych. W tym celu zastosowano cztery kategorie szacowania (wraz ze specjalnym systemem punktacji). Ranking wykazał, że najlepszymi ogrodami okazały się ZOO Kolonia i ZOO Munster, najgorszym – ekspozycje w londyńskim ogrodzie zoologicznym. Zachowanie się zwierząt było kategorią, która generalnie była niżej punktowana, a szczególnie było to widoczne w przypadku goryla. W artykule poczyniono także sugestie dotyczące metody w przyszłych badaniach

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