

EAZA Yearbook 2007/2008

Please note that this document is one chapter of the EAZA Yearbook 2007/2008. Please visit the EAZA website to download the other chapters or the complete Yearbook:

<http://www.eaza.net/activities/cp/Pages/yearbook.aspx>

EAZA Terrestrial Invertebrate TAG

Contents

Please click on the programme name to jump to the report.

TAG Report (by Warren Spencer)

Partula snail (*Partula* spp.) EEP (by Paul Pearce-Kelly)

Fregate Island beetle (*Polposipus herculeanus*) EEP (by Amanda Ferguson)

Lesser Antilles Hercules beetle (*Dynastes hercules hercules*) ESB (by Jean-Yves Robert)

EAZA Terrestrial Invertebrate TAG Annual Report 2007 - 2008



1. Information on organisation, structure and activities of the TAG

- TAG chair:** Warren Spencer, Bristol wspencer@bristolzoo.org.uk
- TAG vice-chair:** Paul Pearce-Kelly, London ppk@zsl.org
- TAG members:** Amanda Ferguson (London)
Donald MacFarlane (London)
Geoff Read (Marwell)
Jean-Yves Robert (Besancon)
Ko Veltman (Amsterdam)
- TAG advisors:**
- General**
 - Behavioural**
 - Taxonomy**
Andrew Smith , British Tarantula Society, Arachnologist
 - Veterinary**
John Chitty, Private
Romain Pizzi , Zoological Medicine Ltd, Pathologist
 - Nutritional**
Andy Beer, Sparsholt College
 - Conservation**
 - Research**
 - Educational**
Stephen Woollard, Edinburgh Zoo (Royal Zoological Society of Scotland)
- Current EEPs:** *Partula* spp (*Partula* spp)
Fregate Island beetle (*Polposipus herculeanus*)
- Current ESBs:** Lesser Antilles Hercules beetle (*Dynastes hercules hercules*)
- TAG meeting:** Date of last meeting: 20 September 2008
Last meeting hosted at Antwerpen Zoo (Royal Zoological Society of Antwerp).
- Regional Collection Plan:** Has a RCP been published? No
- Publications:**
Spencer,WK, and Spencer,J. 2008. (Eds) Management guidelines manual for invertebrate live food. EAZA Executive Office, Amsterdam.

In Press:
Veltman, K. How can zoos import and display butterflies for educational purposes in a sustainable way? International Zoo Yearbook.

2. Information on developments during 2007 - 2008

General developments.

Ko Veltman has announced his resignation as Chair of TITAG (Terrestrial Invertebrate TAG) and thanks all for their support during his tenure. Ko will now be focussing his efforts on the incredibly important Lepidopteran focus as TITAG's RCP officer for Lepidoptera and our IABES (International Association of Butterfly Exhibitors and Suppliers) liaison. Warren Spencer will now continue as TITAG chair.

TITAG and ALPZA (Asociación Latinoamericana de Parques Zoológicos y Acuarios) began working together on the following Invertebrate capacity building elements.

- To define a strategy to provide technical support so that ALPZA collections can develop invertebrate exhibits.
- To define species selection criteria and assist with collection planning where needed.
- To provide basic husbandry training; workshops; husbandry manuals and general information resource.

RCP development summary.

- 377 taxa placed in the source list for consideration.
- 229 taxa assessed (60.7%).
- 108 recommended do not obtain (DNO).
- 121 Assessed and included in the RCP.
- 10 taxa requiring further research before completing assessment.

The process highlighted the following managed taxa:

- 23 EEP programme species.
- 1 ESB programme species.
- 7 Taxa monitored by a nominated individual in TITAG.
- 2 taxa monitored by TITAG.
- 2 taxa currently considered for phasing in.

Collection planning focus group actions for 2009:

- To complete TITAG Regional Collection Plan assessments for as many species as possible by 01.06.09.
- To complete TITAG Regional Collection Plan with all accompanying documents by 01.07.09.

Programme summaries:

Partulid EEP.

The 2007/08 EEP Studbooks record 20 Partulid taxa of which are 15 classified extinct in the wild and 5 critically endangered. Eleven collections currently participate in the EEP (most maintaining 3 or more species). There has been a 16% overall decline in the EEP population. The origin of many population declines are thought to be associated with summer heat stress, experienced at 5 collections during 2007. The equipment and monitoring systems responsible for the environmental control at these collections have since been improved. The significance of microsporidial cysts, identified at 4 separate collections is still the subject of veterinary and student investigation at London. At this stage however no clear association has been made in any study between their presence and accompanying ill-health in captive snails. The following taxa remain of greatest demographic concern within the studbook; *Partula t. elongata*, *P. t. simulans*, *P. mooreana*, *P. radiolata*, *P. faba* and *P. affinis*. Taxa at or near target population size (of 600 specimens) and therefore of least concern; *P. tohiviana*, *P. varia*, *P. suturalis vexillum*, *P. taeniata nucleola*, *P. s. strigosa*, *P. mirabilis*, *P. rosea*, *P. dentifera*, *P. hyalina* and *P. gibba*. Taxa at ~35% of target population size, but in recovery; *P. hebe* and *P. tristis*. Current collection capacity combined with planned new collections, joining in 2009 should enable those species below population targets to be expanded in number. During 2007 and 2008 17 species, (>3,000 specimens) were transferred between 9 collections as part of ongoing population and collection management rationalizations. In December 2008 Copenhagen, Denmark joined the programme with 157 *P. tohiviana* from Edinburgh. At London an inventory was begun in 2008 on all stored pathology material (consisting of approx. 10,000 specimens). Once completed, the entire collection will be donated to the collections of Natural History Museum London for further study.

Conservation activities.

- Report Long Term Conservation and Management Plan for Pacific island tree snails 2008 – 2018 produced.
- Reserve locations on Tahiti and Raiatea identified.
- Ongoing collaboration between French Polynesian Government and EEP participating institutions remains vital to advancing the major conservation progress realised to date. Programme's conservation field Biologist Dr Trevor Coote producing monthly progress reports.

Partulid EEP Evaluation.

The EEP Committee discussed the results and concluded that the evaluation procedure was followed correctly and agreed with the assessment and conclusions; they also encouraged the EEP Coordinator to carry on the good work. Helpful suggestions including widening the flow of information and attendance of one of the future EAZA Breeding Programme Management Courses were welcomed. Generally a well functioning programme with a clear conservation need with 12 of the 22 species managed within the programme being extinct in the wild.

Fregate Beetle EEP

At the end of 2007 there were 761 beetles held in 11 institutions. Some populations were breeding so well that population control measures were employed to avoid creating stock surplus to requirements. Research was instigated at Manchester University (Survey of molecular genetic variance in beetles descended from stock collected in 1996 and 1999, also diet work looking at different types of wood & larval development) and at Edinburgh Zoo (investigation of 3 different diets on larvae development). No major in-situ developments, it is still felt that a PHVA would be the most appropriate way to move forward.

At the end of 2008 there were 676 beetles held in 12 institutions. Again some populations were doing very well but some experienced crashes; reinforcing the opinion that we mustn't get too complacent about this species being 'safe'; the populations need to be monitored & managed. More institutions have expressed an interest in participating in this EEP. The research work at Manchester University (molecular genetic variance) and Edinburgh Zoo continues.

Frégate Island Private (own and manage the Island) have employed an Ecology Manager. Contact has been made and we hope to get an update on the beetle population in the field and how any conservation work is progressing.

Fregate Beetle EEP Evaluation.

The EEP Committee discussed the results and concluded that the evaluation procedure was followed correctly and agreed with the assessment and conclusions. They also encouraged the EEP Coordinator to carry on the good work. Helpful suggestions including the attendance of one of the future EAZA Breeding Programme Management Courses were welcomed. Generally a good example of an invertebrate programme.

Lesser Antilles Hercules beetle ESB.

Throughout 2007/8, the studbook population has remained relatively stable with very similar number in comparison with 2006. There has been challenges in receiving requested population data from a number of institutions which make the management of this studbook and the development of recommendations very difficult. The TAG chair and studbook keeper are working hard to resolve this.

The production of husbandry guidelines are being finalised although care advice can always be acquired from the studbook keeper and resources currently available.

New Programmes:

Jamaican swallowtail (*Pterourus homerus*) conservation programme (monitor) - a joint project between IABES (The international association of butterfly exhibitors and suppliers - project partner that also works enthusiastically with this species) and TITAG. The conservation of Cockpit Country is to be divided in two stages: a first phase leading to the declaration of Cockpit Country as a Governmental Protected Area and a second phase including the implementation of conservation measures once the area is officially protected. On behalf of TITAG, Ko Veltman continues to monitor developments on the in situ status of (*P.homerus*) and acts as liaison with IABES.

3. TAG goals for 2009

1. Conduct as many TITAG RCP assessments as possible and to consider the development of any associated action plans.
2. Publish the TITAG RCP by October 2009.
3. Establish a minimum of three additional *Partula* holding collections.
4. Revise Fregate beetle husbandry guidelines.
5. Produce formalised EAZA format Lesser Antilles Hercules beetle Husbandry guidelines.
6. Develop nutritional values for identified invertebrate live food species.
7. Develop and provide EEP/ESB bi-annual updates on the list serve/website.
8. Publish guidance for the sustainable acquisition of Lepidoptera including a list of EAZA recommended pupae suppliers by March 2009.
9. Establish management status for 'Phased in' species, resulting from the RCP assessment process.
10. Develop links between EAZA and ALPZA institutions to promote the growth of Invertebrate displays and programmes in the ALPZA region.

1. Programme information

Partula snail affinis	<i>Partula affinis</i>
Partula snail clara	<i>Partula clara</i>
Partula snail dentifera	<i>Partula dentifera</i>
Partula snail faba	<i>Partula faba</i>
Partula snail gibba	<i>Partula gibba</i>
Partula snail hebe bella	<i>Partula hebe bella</i>
Partula snail hyalina	<i>Partula hyalina</i>
Partula snail mirabilis	<i>Partula mirabilis</i>
Partula snail mooreana	<i>Partula mooreana</i>
Partula snail nodosa	<i>Partula nodosa</i>
Partula snail otaheitana	<i>Partula otaheitana</i>
Partula snail radiolata	<i>Partula radiolata</i>
Partula snail rosa	<i>Partula rosa</i>
Partula snail suturalis strigosa	<i>Partula suturalis strigosa</i>
Partula snail suturalis vexillum	<i>Partula suturalis vexillum</i>
Partula snail suturalis vexillum (SxD)	<i>Partula suturalis vexillum (SxD)</i>
Partula snail taeniata elongata	<i>Partula taeniata elongata</i>
Partula snail taeniata nucleoli	<i>Partula taeniata nucleoli</i>
Partula snail taeniata simulans	<i>Partula taeniata simulans</i>
Partula snail tohiveana	<i>Partula tohiveana</i>
Partula snail tristis	<i>Partula tristis</i>
Partula snail varia	<i>Partula varia</i>

EEP established in 1995

Goal(s)

Percentage of gene diversity 90% saved in 100 years.

2. Programme personnel

Species coordinator

Paul Pearce-Kelly (London)

Species coordinator

Neil Maddison (Bristol)
Warren Spencer (Bristol)
Richard Gibson (Chester)
Roger Wilkinson (Chester)
Ian Valentine (Edinburgh)
Gerardo Garcia (Jersey)
Donald MacFarlane (London)
Geoff Read (Marwell)
Colomba De La Panouse (Thoiry)

3. Activities

Species Committee

Last election:
Last meeting: 26 May 2001 London.

Conservation activities

Not specified.

Research activities

Not specified.

4. Publications

Studbook

Recent edition: 2008
Next edition: 2009

Husbandry guidelines

Published in 2007.

5. Status and developments over the year 2005

Partula snail affinis

Partula affinis

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		BRISTOL	0.0.62	0.0.25
		EDINBURGH	0.0.68	0.0.32
		LONDON	0.0.29	0.0.0
		Total (3)	0.0.159	0.0.57

Discrepancy notes

Partula snail affinis

Partula affinis

LONDON Snails sent to Imperial College research group

Partula snail clara

Partula clara

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		LONDON	0.0.189	0.0.0
		Total (1)	0.0.189	0.0.0

Discrepancy notes

Partula snail clara

Partula clara

LONDON Snails sent to Imperial College research group

Partula snail dentifera

Partula dentifera

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		BRISTOL	0.0.201	0.0.296
		THOIRY	0.0.330	0.0.432
		Total (2)	0.0.531	0.0.728

Partula snail faba

Partula faba

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		BRISTOL	0.0.61	0.0.62
		THOIRY	0.0.53	0.0.2
		Total (2)	0.0.114	0.0.64

Partula snail gibba

Partula gibba

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		LONDON	0.0.41	0.0.0
		THOIRY	0.0.899	0.0.350
		Total (2)	0.0.940	0.0.350

Discrepancy notes

Partula snail gibba

Partula gibba

LONDON Snails sent to Imperial College research group

Partula snail hebe bella

Partula hebe bella

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		EDINBURGH	0.0.77	0.0.71
		LONDON	0.0.136	0.0.7
		POZNAN	0.0.59	0.0.125
		Total (3)	0.0.272	0.0.203

Partula snail hyalina
Partula hyalina

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		CHESTER	0.0.113	0.0.44
		MARWELL	0.0.86	0.0.265
		THOIRY	0.0.100	0.0.58
		Total (3)	0.0.299	0.0.367

Partula snail mirabilis
Partula mirabilis

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		CHESTER	0.0.216	0.0.273
		EDINBURGH	0.0.10	0.0.0
		POZNAN	0.0.66	0.0.172
		Total (3)	0.0.292	0.0.445

Partula snail mooreana
Partula mooreana

New	No reply	Participants	Status 1 Jan	Status 31 Dec
*		EDINBURGH	0.0.0	0.0.6
		JERSEY	0.0.46	0.0.62
		LONDON	0.0.302	0.0.0
		Total (3)	0.0.348	0.0.68

Partula snail nodosa
Partula nodosa

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		EDINBURGH	0.0.40	0.0.158
		LONDON	0.0.14	0.0.0
		Total (2)	0.0.54	0.0.158

Partula snail otaheitana
Partula otaheitana

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		CHESTER	0.0.2	0.0.0
		Total (1)	0.0.2	0.0.0

Partula snail radiolata
Partula radiolata

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		LONDON	0.0.116	0.0.1
		RIGA	0.0.12	0.0.0
		Total (2)	0.0.128	0.0.1

Partula snail rosea
Partula rosea

New	No reply	Participants	Status 1 Jan	Status 31 Dec
*		MARWELL	0.0.170	0.0.80
		WHIPNADE	0.0.141	0.0.362
		Total (2)	0.0.311	0.0.442

Partula snail suturalis strigosa
Partula suturalis strigosa

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		BRISTIOL	0.0.122	0.0.109
		LONDON	0.0.186	0.0.107
		POZNAN	0.0.95	0.0.259
		Total (3)	0.0.403	0.0.475

Partula snail suturalis vexillum
Partula suturalis vexillum

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		EDINBURGH	0.0.37	0.0.214
		LONDON	0.0.89	0.0.0
		Total (2)	0.0.126	0.0.214

Partula snail suturalis vexillum (SxD)
Partula suturalis vexillum (SxD)

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		LONDON	0.0.61	0.0.37
		Total (1)	0.0.61	0.0.37

Partula snail taeniata elongata
Partula taeniata elongata

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		BURSCOUGH_NE	0.0.72	0.0.0
*		LONDON	0.0.0	0.0.10
		Total (2)	0.0.72	0.0.10

Partula snail taeniata nucleoli
Partula taeniata nucleoli

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		JERSEY	0.0.34	0.0.106
		LONDON	0.0.273	0.0.182
		Total (2)	0.0.307	0.0.288

Partula snail taeniata simulans
Partula taeniata simulans

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		BRISTOL	0.0.66	0.0.8
		LONDON	0.0.36	0.0.0
		Total (2)	0.0.102	0.0.8

Partula snail tohiveana
Partula tohiveana

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		BRISTOL	0.0.46	0.0.57
		EDINBURGH	0.0.42	0.0.177
*		KOBENHAVN-ZOO	0.0.0	0.0.157
		LONDON	0.0.75	0.0.290
		Total (4)	0.0.163	0.0.681

Partula snail tristis
Partula tristis

New	No reply	Participants	Status 1 Jan	Status 31 Dec
*		BRISTOL	0.0.0	0.0.24
		LONDON	0.0.74	0.0.4
		RIGA	0.0.58	0.0.98
		THOIRY	0.0.240	0.0.79
		Total (4)	0.0.372	0.0.205

Partula snail varia
Partula varia

New	No reply	Participants	Status 1 Jan	Status 31 Dec
		BURSCOUGH_NE	0.0.7	0.0.0
		CHESTER	0.0.176	0.0.216
		LONDON	0.0.55	0.0.1
		MARWELL	0.0.220	0.0.363
		RIGA	0.0.98	0.0.173
		Total (5)	0.0.536	0.0.173



Partula snail EEP Annual Report 2007 - 2008



Summary

For more information see Terrestrial Invertebrate TAG report.

Notes

31/12/08 Five snails were held by Imperial College University Research Group.



Fregate Island beetle

EEP Annual Report 2007 - 2008



1. Programme information

Fregate Island beetle

Polposipus herculeanus

EEP established in 2002.

Goal(s)

Percentage of gene diversity 90% saved in 100 years.

Additional cc

This is a colony managed species. Some of the population is managed predominantly to maintain maximum generation length and some is kept as mixed generation. Two separate lines were originally maintained but these have now been combined in order to minimise genetic drift.

The aim is to establish sustainable breeding populations at 10-12 institutions.

A review of programme goals is to be conducted over 2009-2010.

2. Programme personnel

Species Coordinator

Amanda Ferguson (London)

3. Activities

Species Committee

Last election:

Last meeting: 23 September 2004 Kolmarden

Conservation activities

Not specified.

Research activities

Research is being conducted at three institutions:

RIGA - Diet and larval development

EDINBURGH - Diet and larval development development

MANCHESTER UNIVERSITY -

Comparative molecular work on descendants of populations collected in 1996 and 1999

4. Publications

Studbook

Recent edition: Not yet published.

Next edition: N/A

Husbandry guidelines

Published in 2004.



Fregate Island beetle
EEP Annual Report 2007 - 2008



5. Status

Status and developments over the year 2007 - 2008

Fregate Island beetle

Polposipus herculeanus

New	No reply	Participants	Status 1 Jan.	31. Dec.
		RIGA	0.0.154	0.0.137
		AMSTERDAM	0.0.54	0.0.17
		POZNAN	0.0.8	0.0.40
		MOSKVA	0.0.12	0.0.24
		BRISTOL	0.0.236	0.0.151
		LONDON	0.0.465	0.0.124
		MARWELL	0.0.35	0.0.50
*		KOBENHAVN-ZOO	0.0.0	0.0.25
*		EDINBURGH	0.0.0	0.0.20
*		WHIPSNADE	0.0.0	0.0.15
		Total (10)	0.0.964	0.0.603

Discrepancy notes

Fregate Island beetle

Polposipus herculeanus

MARWELL Joined EEP in 2006 stock sent from ZSL.

Summary

New institutions have joined the EEP and more are waiting to participate.

Some populations are breeding so successfully that these are being managed to stay within the carrying capacity of the holding institutions. However, populations can also suddenly crash, instances where this occurs are being investigated.

In situ information is sparse. Anecdotally it appears the beetles numbers are maintaining but no monitoring & research is being carried out.

1. Programme information

Lesser Antilles Hercules beetle

Dynastes hercules hercules

ESB established in 2006.

Goal(s)

Percentage of gene diversity 90% saved in 100 years.

2. Programme personnel

European Studbook Keeper

Jean-Yves Robert (Besançon)

3. Publications

Studbook

Recent edition: Not yet published.

Next edition: 2009

Husbandry guidelines

Published in 2005.

4. Status

Status and developments over the year 2007 - 2008

Lesser Antilles Hercules beetle

Dynastes hercules hercules

New	No reply	Participants	Status 1 Jan.	Births (DNS)	EAZA zoos		non-EAZA zoos		Deaths	31. Dec.
					In	Out	In	Out		
		BESANCON	0.0.130	0.0.826 (0.0.0)	0.0.0	0.0.83	0.0.0	0.0.74	0.0.655	0.0.144
		BRISTOL	0.0.10	0.0.64 (0.0.0)	0.0.35	0.0.0	0.0.0	0.0.48	0.0.0	0.0.61
	*	BUDAPEST	0.0.165	0.0.189 (0.0.0)	0.0.0	0.0.0	0.0.0	0.0.0	0.0.170	0.0.184
*		KOBENHAVN-ZOO	0.0.0	0.0.0 (0.0.0)	0.0.26	0.0.0	0.0.0	0.0.0	0.0.0	0.0.26
*		LILLE	0.0.0	0.0.0 (0.0.0)	0.0.5	0.0.0	0.0.0	0.0.0	0.0.0	0.0.5
		LONDON	0.0.51	0.0.118 (0.0.0)	0.0.0	0.0.0	0.0.0	0.0.0	0.0.42	0.0.127
*		MARWELL	0.0.0	0.0.0 (0.0.0)	0.0.15	0.0.0	0.0.0	0.0.0	0.0.0	0.0.15
	*	MOSKVA	0.0.14	0.0.0 (0.0.0)	0.0.0	0.0.0	0.0.0	0.0.0	0.0.4	0.0.10
	*	POZNAN	0.0.103	0.0.0 (0.0.0)	0.0.2	0.0.0	0.0.0	0.0.0	0.0.0	0.0.105
		Total (9)	0.0.473	0.0.1197 (0.0.0)	0.0.83	0.0.83	0.0.0	0.0.122	0.0.871	0.0.677

Discrepancy notes

Lesser Antilles Hercules beetle

Dynastes hercules hercules

BUDAPEST	no reply for 2008
LONDON	including Whipsnade stock
MOSKVA	no reply for 2008
POZNAN	no reply for 2008

Summary

In 2007, the population remain stable with very similar number in comparison with 2006. The status on 31 December 2006 was 448 in comparison to 464 in 2007. In 2006 there were resp. 623 births and 528 deaths, versus 615 births and 583 deaths in 2007.

Unsolved issue is that still only two institutions (Besançon and Budapest) hold more than 71% (66% in 2006) of the population, and even 100% of the birth (68 % in 2006). We hope that the other participants will start to increase their captive population in the near future.

The high mortality rate is mostly artificial and due to the same reason as in previous years: euthanasia of surplus larva. For example at Besançon, we don't need to keep more than 4.4 new born larva each month (about 100 grubs per year). Normally, we obtain between 35 and 40 adults pairs from them. We can't minimize the number of the laying females (a solution to prevent surplus!) because there is a potential risk of decrease of the genetic diversity, which would effect the viability of the captive population.

Population Management

Due to the difficulty to recognize each specimen (especially at adult stages in mixed breeding groups), global group inventory appear to be the only

way for monitoring. At least, each institution is willing to keep each generation separate and use the coding system proposed by the studbook keeper. When 2 generations are present at the same time (for example actually at Budapest and Besançon), it is said to stop breeding with the previous generation until the following generation starts to breed. If needed, use adult males from previous generation "n" to pair with the first females from the following generation "n+1" if males "n+1" are not available. In this case, the number of the descendants will be "n+2" (just depending of the laying females).

Regarding the size of adult specimen (it gives a good idea about the breeding conditions), the average body size still increases with each new generation at Besançon:

	mean for males (mm)	mean for females (mm)
F2	122,8 (N=3)	65,8 (N=5)
F3	126,6 (N=9)	68,1 (N=7)
F4	125,9 (N=6)	67,9 (N=5)
F5	128,9 (N=11)	67,6 (N=24)
F6	132,3 (N=30)	72,2 (N=35)
F7	129,2 (N=19)	72,7 (N=43)

Following the questionnaires, other institutions seem to have smaller adults (use the table above to compare). Therefore we have attached the breeding recommendations to obtain bigger adults:

- maintain grubs between 20 and 25°C (if warmer, the growth will be faster but the adults smaller)
- select the bigger larva from each stock when you have to eliminate surplus (use the width of the cephalic head, not the weight)
- use only the bigger adult males for breeding (the others could be placed together in a bachelor group for exhibit)
- add dry food for exotic fishes (high protein levels) in the food substrate for the first larval stages (L1 and L2). It's a new method still under investigation but it seems likely to work.

Research:

The programme has participated to the work of Pr Jean-Paul Vigneron and researcher Marie Rassart regarding the coloration change of the males elytra depending of the humidity level of the atmosphere.

Rassart M., J-F Colomer, T. Tabarrant and J-P Vigneron, 2008: Diffractive hygrochromic effect in the cuticle of the hercules beetle *Dynastes hercules*. *New Journal of Physics*, 10(2008) 033014 (14p). Electronic copy available upon request from the Studbook keeper.

Programme difficulties:

One institution (Plock) haven't sent any information or data since they have received breeding stock in September 2005. Therefore they have been excluded from the ESB in 2007.

All other institutions have replied in 2007 and all mistakes have been solved after contact with the ESB representatives.

In 2007, only Besançon and Budapest have obtained larvae. However, Poznan and London (+ Whipsnade) normally hold enough stock to establish sustainable breeding populations in the near future. Other institutions have to receive additional specimen.

In 2008 Besançon, Bristol, London and Whipsnade have obtained larvae.

The population remains (probably) stable but too many data are missing for a good analysis of the whole population. Also the management of the studbook is really difficult and the interest to continue this ESB is in question. We hope that 2009 will be better...

Some institutions have not sent their data for 2008 (Poznan, Moskva and Budapest), so the final status on 31/12/2008 is not accurate, we expect that there are more specimen than indicated.

Programme recommendations :

New institutions would like to be involved with the species : Lille, Marwell, Copenhagen, Helsinki and Warsaw. During 2007/08 Lille, Marwell and Copenhagen received their first stock. Helsinki and Warsaw are on the waiting list to receive specimen and to start holding the species in 2009. Budapest is willing to send surplus to Moscow Zoo. Bristol Zoo has already received surplus from Besançon in 2008. In addition, a contact is under progress with Santa Ana Zoo (USA).