

Looking at *Baculum* eggs.

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Key words

Phasmida, *Baculum* spp., Eggs.

Whilst examining a sample of unidentified *Baculum* eggs (PSG 144) I had occasion to look through the various published figures and descriptions (Table 1). The first thing to notice is the paucity of detailed information and inconsistency in the way the information is presented. Very rarely are two views shown of the egg, or dimensions given for all three major dimensions. Often dimensions are given to the nearest millimetre; even so the figures can vary wildly - partly because authors do not follow the standard system of measuring "length" as capsule length **not** including the size of growths rising from the operculum. These growths, incidentally, have been called "capitula" though to the best of my knowledge no *Baculum* species carries a capitulum. On one occasion an egg was even shown in two views which were mutually inverted. Where egg drawings are shown they sometimes differ significantly from what can be seen when you look at the egg itself under modest magnification. In the table I have given the dimensions as length, height, width, according to the standard system, though in the literature length has been called "height", height "breadth" or "width", and width "thickness". The species are grouped into Hausleithner's types and then arranged roughly in order of size within any one type.

Baculum consists of a large number of species most of which were described by Brunner (1907) in the genera *Clitumnus* Stål and *Cuniculina* Brunner. Sadly, the egg types do not match up with these two generic concepts. Eight *Clitumnus* and 19 *Cuniculina* are included in Table 1, with each "genus" appearing with each egg type. The type species of *Baculum* is Westwood's *Bacillus cuniculus* which Brunner placed in *Cuniculina* and which has the egg type **III** of Hausleithner.

Baculum is a taxonomic hotch-potch if its eggs are anything to judge by. I recognised two types (Clark, 1979): type i based on *B. extradentatum* and type ii based on what was later to be named *Baculum thaili*. Carlberg (1983) called the two types *extradentatus*-group and *artemis*-group. Hausleithner, who has published many phasmid egg descriptions, for some reason referred to my paper but made my type i his type **II** and my type ii his type **I** (a source of confusion for future workers) and added a type **III** based on *B. hypereon*. His types **I** and **III** were both included by Carlberg in the *artemis*-group. Hausleithner briefly defined his types as follows:

I - Flat, oblong and more or less narrow (Flach, länglich und mehr oder weniger schmal).

II - Cask-shaped; surface textured. (Tönnchenförmig; Oberfläche strukturiert).

III - Oblong-cylinder shaped; characteristic operculum rim and indented posterior end (Länglich-zylinderförmig; charakteristischer Eideckelrand und eingekerbte Eibasis).

These three types are listed separately in Table 1, although I am not convinced that *B. irilineatum* is my type i, since it does not appear to have the pseudocapitulum of the other two species of this type. Another possibility for Hausleithner's **II** is PSG 24, originally said to be *B. impigrum* and whose egg is slightly, but distinctly different from that of *B. extradentatum* with which it is now equated. Hausleithner's *B. impigrum* is clearly a type ii egg.

Key to Table 1.

Dimensions of length, height and width are in mm.

The genera used by Brunner are indicated in column 2: Cu. = *Cuniculina*, Cl. = *Clitumnus*.

Views: D = dorsal, L = left, R = right, O = opercular, P = posterior, I = inverted.

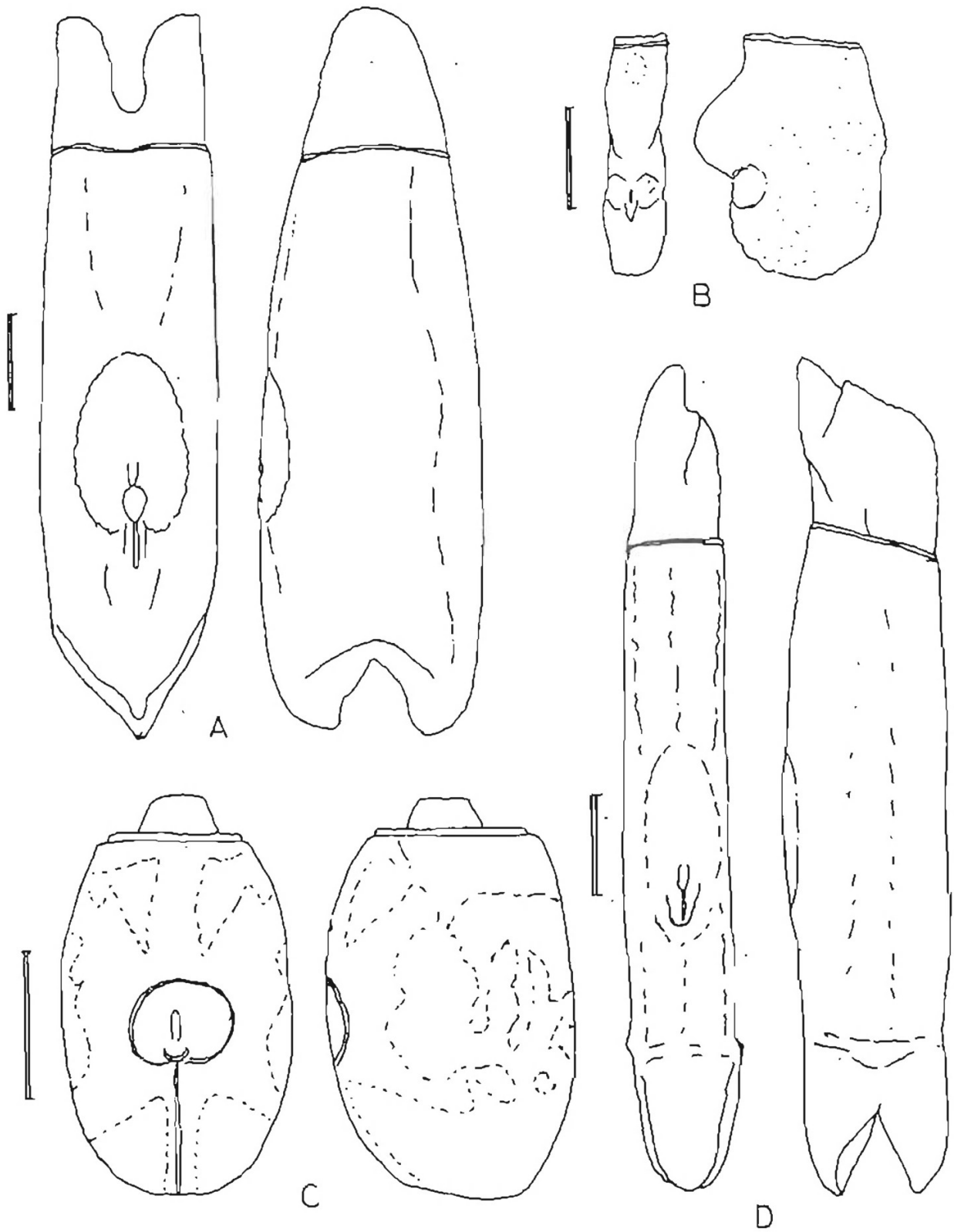
** = not PSG 24.

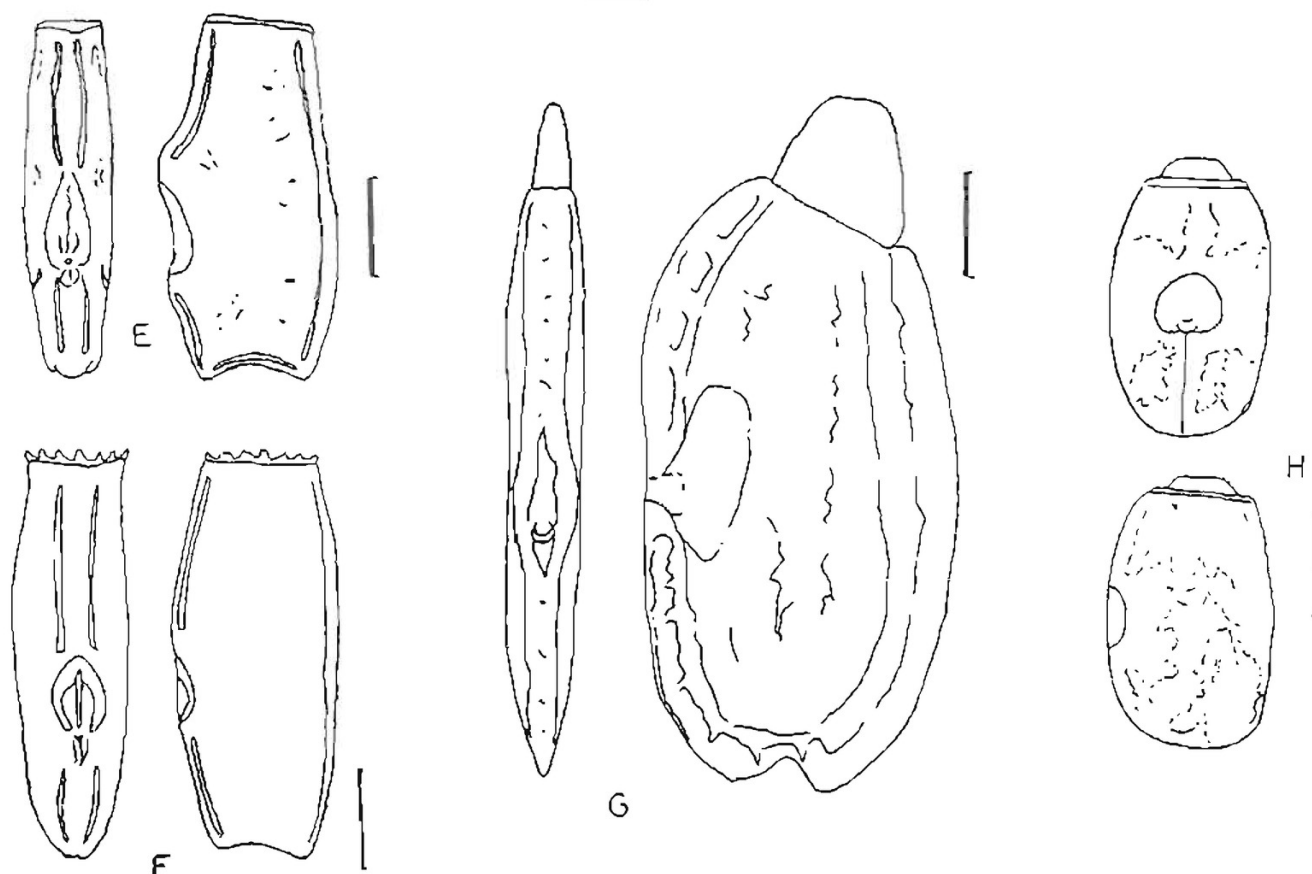
* = the type species for Hausleithner's type **I**, **II**, and **III**.

Type	Br.	species name	source	view	length	height	width	authority
I	Cu.	bidentatum (Brunner)	Java	L	7	2	1	Hausleithner 1988
	Cu.	malacense (Brunner)	Perak etc.	R	7	2	0.7	Hausleithner 1988
	Cu.	nematodes (de Haan)	Java etc.	R	6	2	-	Hausleithner 1986
	Cu.	insuctum (Brunner)	Perak etc.	L	6	2.3	0.8	Hausleithner 1988
				DR	5.6	3.0	0.6	new data
	Cu.	eminens (Brunner)	Java	L	5	2	1	Hausleithner 1988
	Cu.	arrogans (Brunner)	India	R	5	1.3	-	Hausleithner 1986
	Cu.	decolyti (Brunner)	?	R	5	1.3	-	Hausleithner 1986
	Cl.	artemis (Brunner)	Bhutan	D	4.4	-	1.3	Cappe de Baillon <i>et al</i> 1934
	Cu.	mediocre (Brunner)	Java	L	4	2	-	Hausleithner 1986
	Cu.	verecundum (Brunner)	Java etc.	L	3-4	1.3	1	Hausleithner 1988
	-	PSG 144	Vietnam	DR	3.8-4.0	1.5-1.6	1.1	new data
	-	thaii (Hausleithner)*	Thailand	DR	3-3.5	-	-	Hausleithner 1986
				DR	3.6	1.6	0.8-1.0	Sellick 1980
				LPO	4	2	-	Allington 1981
				R	3.3	1.6	1.1	Deschandel 1991
				L	4	-	-	Floyd 1987
	Cu.	anceps (Brunner)	Vietnam	R	3.5	2	-	Hausleithner 1986
	Cu.	recessum (Brunner)	New Guinea	R	3.5	2	-	Hausleithner 1986
	Cl.	acerratum (Brunner)	Java etc.	R	3.5	2	-	Hausleithner 1986
	Cu.	impigum (Brunner)**	Tonkin etc.	L	3.2	2.2	1	Hausleithner 1986
	Cu.	warbergi (Brunner)	Java	R	3	1.7	1	Hausleithner 1988
	Cu.	irregulariterdentatum (Br.)	Japan?	DR	2.5	2	1	Yasumatsu 1942
	Cu.	frustrans (Brunner)	India	DB	2.3-2.4	1.9-2.0	0.5-0.6	new data
	-	PSG 114	Thailand	DL	2.6	1.6	0.7	van Herwaarden 1989
	Cl.	enodatum (Brunner)	India	R	2	1.2	-	Hausleithner 1986
II	Cl.	trilineatum (Brunner)	Sri Lanka	R	2.5	1.5	-	Hausleithner 1986
	Cu.	annamense (Brunner)	Annam	DL	2.8	1.8	-	Hausleithner 1988
	Cl.	extradentatum (Brunner)*	Vietnam	R	2.5	1.5	-	Hausleithner 1986
				DR	2.2-2.4	1.5-1.6	1.4-1.6	Clark 1976
III	Cu.	inverecundum (Brunner)	Sri Lanka	DR	8	2	-	Hausleithner 1986
	Cu.	regina (Brunner)	Tonkin etc.	R	8	1.2	-	Hausleithner 1988
	Cl.	hyperoon (Westwood)*	Sri Lanka	R	7-8	1.5	-	Hausleithner 1986
	Cl.	attigens (Brunner)	?	-	7-8	1.5	-	Hausleithner 1986
	Cl.	rivale (Brunner)	?	-	7-8	1.5	-	Hausleithner 1986
	Cu.	insignis (Wood-Mason)	India	DR	6.6	1.5-1.6	1.0	new data
				R	8-9	2	1	Kacubuhler 1989
				DLI	7.3-9	1-1.8	0.8-1	Hausleithner 1990
	Cu.	cuniculum (Westwood)	?	DR	5.6-6.2	2.0-2.1	1.8	Sellick 1980

Table 1. Dimensions of *Baculum* eggs.

I illustrate the eight species of *Baculum* eggs in my reference collection in the standard views as an illustration of how diverse this apparent genus actually is. In each case the scale line represents 1mm.





Legends to Figures A-H.

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| A. <i>B. cuniculum</i> (type III) | E. <i>B. thail</i> PSG 22 (type I) |
| B. <i>B. frustrans</i> PSG 95 (type I) | F. <i>B. sp.</i> PSG 144 (type I) |
| C. <i>B. impigrum?</i> PSG 24 (type II) | G. <i>B. insueta</i> PSG 55 (type I) |
| D. <i>B. insignis</i> PSG 94 (type III) | H. <i>B. extradentatum</i> PSG 5 (type II) |

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