

**The structure of the phallic complex in the genus
Thericles (Preliminary report)
(Orth. Acridoidea)**

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In 1963, Professor M. J. D. White offered me for identification a considerable number of specimens of the genus *Thericles* collected by himself and Mr. H. Dick Brown in South Africa. The primary object of Professor White was cytogenetic studies of the genus; thus the exact names and, if possible, the inter-relations of the species from the taxonomic point of view were essential in order to correlate the cytogenetical findings with the systematic position of the specimens studied.

The task, however, appeared more difficult than was anticipated because, after cursory examination, it was found that the material contained more than twenty new species of the genus *Thericles* Stål, 1875 and four species of other closely related genera. Study of the phallic complex complicated the problem even more. It appeared that the genus possesses one of the most complicated forms of the phallic complex so far known in Eumastacidae. It is very different from that of the other subfamilies of this family. In order to achieve any reliable systematic arrangement within the genus it would be necessary to revise the whole genus, splitting it up into several genera, and even to undertake a revision of the whole subfamily *Thericleinae*. This task could only be accomplished in several years.

For the purpose of facilitating Professor White's studies, however, this preliminary report is presented.

Phallic complex of the genus *Thericles* Stål, 1875 (*sensu lato*).

The first impression of the phallic complex is that it is extremely

complicated, and the second is its diversity within the genus. The latter suggests that the genus, as now comprised, is most probably an assemblage of several genera. The general plan of the phallic complex, however, in its principal parts, is constant. In all cases (see figs. 1, 2) the ejaculatory duct (*a*) is connected with a small, strongly sclerotised eja-

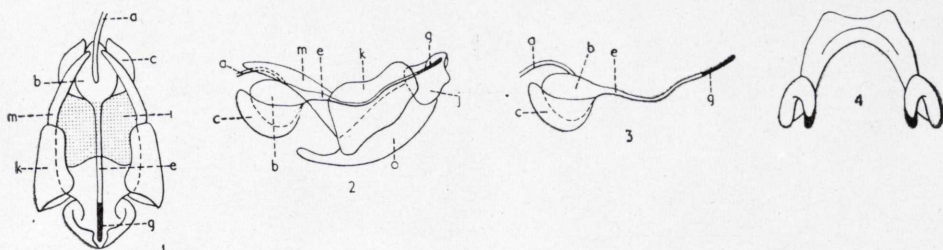


Fig. 1.—Phallic complex of *Thericles whitei* sp. nov.; 1) phallic complex from above, epiphallus removed; 2) the same, lateral view; 3) endophallus, lateral view; 4) epiphallus.

Symbols: *a*, ejaculatory duct. *b*, ejaculatory sac. *c*, lateral “wing” of ejaculatory sac. *d*, ventral “keel” of ejaculatory sac. *e*, soft, weakly sclerotised duct, merging with the apical, strongly sclerotised part (*g*). *f*, sclerotised, chamber-like thickening. *g*, strongly sclerotised duct, representing continuation of the duct *e* and considered as the penis. *h*, strongly sclerotised formation connected with the chamber-like thickening *f*. *i*, internal envelope, covering apical part of endophallus. *j*, external envelope covering apical part of endophallus. *k*, strongly sclerotised lateral plates of ectophallus. *l*, soft, membranous part of dorsal side of ectophallus. *m*, strongly sclerotised bar-like formations of ectophallus. *o*, ventral, membranous part of ectophallus. *p*, epiphallus.

culatory sac (*b*); to the sac the lateral sclerites, “wings” (*c*), and the large ventral plate, “keel” (*d*), are attached, and this whole structure is at the extreme proximal end of the phallic complex and is movable in a proximo-distal direction. From the distal end of the ejaculatory sac a long duct (*e*) emerges; towards its distal end this duct is of different structure in different species, but it invariably merges into a strongly sclerotised distal part (*g*) which may be considered as a penis, analogous to that organ in other Acridoidea. The duct *e* and the penis are not paired. The epiphallus is in all cases an arch-like structure, with strongly sclerotised and hooked posterior ends.

On the basis of the phallic complex the species of the genus *Thericles* can be divided into two main groups. The first group contains the species coded *A* (in Professor White’s labelling); this is the group in which the duct *e* and its sclerotised part *g* go straight to the distal end, forming the end of the penis. In the second group, the extreme case is coded *G*; the duct *e* is coiled several times, then joined to a small widening (*f*) beyond which it emerges as a strongly sclerotised duct *g*

which extends on the ventral side towards the proximal end and on the dorsal side is reversed towards the distal end, terminating as the penis-like structure.

These two cases (figs. 1, 2) are the extreme ranges of diversity. However, there are species more or less strongly deviating in details,

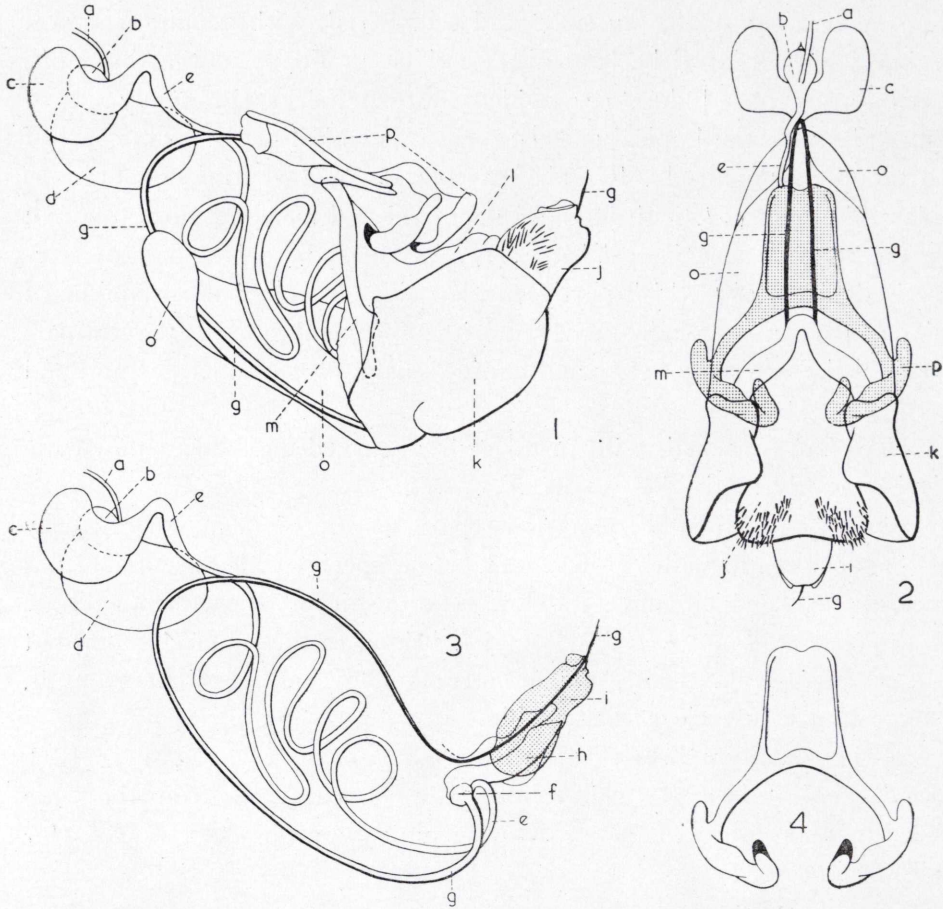


Fig. 2.—Phallic complex of *Thericles brozeni* sp. nov.; 1) phallic complex, lateral view; 2) the same, from above; 3) endophallus lateral view; 4) epiphallus. (For explanation of symbols see fig. 1).

with the coiled part of the duct *e* and the sclerotised part *g* shortened. All of these can be placed as intermediate forms.

To facilitate the cytogenetic research already mentioned, I am preliminarily describing the phallic complex of these two extreme species. Full descriptions of them are postponed until a revision of the whole genus is possible.

Thericles whitei sp. nov.

(Fig. 1).

Preliminary description; ♂ type. Phallic complex: ejaculatory duct joining ejaculatory sac from above at its distal end. Ejaculatory sac moderately small, muscular and sclerotised, with a pair of lateral wings and a ventral keel; at distal end sac gradually merges into soft, weakly sclerotised duct (*e*), which in turn merges gradually into a strongly sclerotised apical part (*g*) which is end of penis. This part of structure is unpaired. Ectophallus consists of a ventral membranous plate-like part (*o*), with its sides upcurved and merging with a pair of strongly sclerotised lateral bars (*m*); on sides there is a pair of sclerotised plates (*k*) which partly envelop sides of ectophallus; middle of dorsal part of ectophallus covered with thin membrane (*i*); apical part sheath-like, covering below and at sides distal part of duct (*e*) and end of penis (*g*).

Epiphallus arched, with distal ends upcurved and apices downcurved, obtusely tooth-like.

This type or phallic complex is characteristic of *T. whitei* coded by Professor White with the letter *A*. The species coded *V* and *O* are nearest to *A*, which suggest a close relationship between them. Those coded *C*, *CC*, *D*, *DD*, *EE*, *GG* and *L* belong to the same *A* group but differ from *A* in details much more than *V* and *O* differ from it, suggesting a less close relationship.

Type locality: S. Africa. Haenertsburg, 6m. NE, N. Tvl., 12.2. 1963. 1 ♂ type (M. J. D. White). 3 ♂ ♂ paratypes from the same locality and date (H. D. Brown). Cytology prep. No. A 217 (for all specimens).

Thericles browni sp. nov.

(Fig. 2).

Preliminary description: ♂ type. Phallic complex: ejaculatory duct (*a*) joining ejaculatory sac (*b*) from above at its distal end. Ejaculatory sac small, muscular and strongly sclerotised; lateral wings (*c*) and ventral keel (*d*) of sac, very large; at its distal end sac merges gradually into soft, weakly sclerotised duct (*e*), which is very long and

coiled inside ectophallus; at distal end duct *e* joins small, strongly sclerotised, chamber-like thickening (*f*) and then emerges from other side of thickening as strongly sclerotised, narrow, cord-like, elliptically curved duct (*g*); distal end of this duct is end of penis. To distal side of chamber-like thickening (*f*) a strongly sclerotised structure (*h*) is attached; it is split dorsally and open distally, forming a strong supporting part, inside which penis *g* can move. Ectophallus consists of a ventral, membranous, plate-like part (*o*), with a pair of lateral, strongly sclerotised bars (*m*), which are fused at dorsal side; at sides of ectophallus there is a pair of sclerotised plates (*k*), which partly envelop its sides. Apical part of ectophallus consists of internal apical envelope (*i*) covering part of endophallus, and external apical envelope (*j*) covering internal envelope *i*; the whole apical part *j* is covered above with strong, spine-like bristles. Epiphallus (*p*) arched, with posterior part greatly extended proximally to arch; posterior ends of arch terminated by transverse bars, inner parts of which are tooth-like, upcurved and strongly sclerotised.

This type of phallic complex is the extreme form characteristic of the group of species which includes *T. browni*. This new species is coded by Prof. White with the letter *G*. The species coded by the letters *AA*, *B* and *M* are the nearest to *G* in respect of the structure of the phallic complex; others coded by the letters *BB*, *U* and *X* are of the same group as *G* but deviate more in details and are therefore probably less closely related to it.

Type locality: S. Africa. 6m. SE Messina, N. Tvl., 2.5.1963, 1 ♂ (Type), 1 ♂ paratype (M. J. D. White), 1 ♂ paratype, 2.5.1963 (H. D. Brown). 1 ♂, paratype, 2.5.1963 (W. Fürst). (Cytology prep. No. A 398, for all specimens.)

