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A STUDY OF HEMISPERMATOPHORES IN INDIAN SCORPIONS OF THE FAMILIES CHAERILIDAE, VAEJOVIDAE AND ISCHNURIDAE

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INTRODUCTION

Waygoldt (1975) has described the indirect process of sperm transfer through Spermatophore in the six orders of Aranchids namely Scorpionida, Chelonethi (Pseudoscorpionida), Uropygida, Schizomida, Amblypygida and Acarina. He has described the process of formation of glued spermatophores in these different groups. Such spermatophores in scorpions are formed in paraxial organs of male reproductive system. The right paraxial organ produces the right spermatophore (=Hemispermatophore) and the mirror image, on the left, is produced by the left paraxial organ. It is difficult to obtain a complete glued spermatophore which limits the studies of this structure in this group. So it is generally preferred to study the hemispermatophore which can be obtained by dissecting the mature males. The present communication deals with the studies of hemispermatophores in details in one species of each Indian Scorpion families namely Chaerilidae, Vaejovidae (?) and Ischnuridae.

The reports on the glued post-insemination spermatophore of Indian species *Mesobuthus tamulus tamulus* (Fabr.) (family Buthidae) and *Heterometrus* (*chersonesometrus*) *scaber* (Pocock) (family Scorpionidae) are available by Bastawade (1992) and by Mathew (1957) respectively. The flagelliform spermatophore in the family Buthidae has been described in details. The lamelliform spermatophore in scorpionidae however, is not much specifically described and needs further studies. The details of the hemispermatophore for the family chaerilidae in *chaerilus tricostatus* Pocock has been described for the first to the knowledge of Arachnology.

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Family : CHAERILIDAE

Chaerilus tricostatus Pocock

(Figs. 1-3)

Hemispermatophore lamelliform : Total length 4·50 mm, pedicel 0·50 mm, trunk 2·00 mm long and 0·75 mm wide, capsule 1·50 mm long, lamella 1·00 mm long and 0·50 mm wide. Truncal flexure weakly noticed, capsular portion simple and lined with three to four chitinous ridges forming a sperm duct (Fig. 1 & 2). An additional chitinous ridge opposite to the sperm duct is seen (Fig. 2), function is not known.

Family : VAEJOVIDAE (?)

Scorpiops (Scorpiops) hardwickei (Gervias)

(Figs. 4-6)

Hemispermatophore lamelliform, much distinctly curved. Total length 5·30-5·60 mm, pedicel 0·70-1·00 mm long, trunk 2·10 mm long and 0·90 mm wide, lamella 2·50 mm long and 0·50mm wide. Truncal flexure prominent (Fig. 5), capsular region complicated, lined with more chitinous ridges, some forming sperm duct (Figs. 4-6). Lamella coiled on the distal portion and bent outwardly.

Family : ISCHNURIDAE

Iomachus laeviceps malbarensis Pocock

(Figs. 7-9)

Hemispermatophore lamelliform, curved but not as curved in the *Scorpiops* vaejovids. Total length 6·20 mm long, pedicel 0·50 mm long, trunk 1·70 mm and 0·50 mm wide, lamella 4·00 mm long and 0·30 mm wide. Trunk short and not uniformly wide, truncal flexure prominent. Capsule bulging with more number of chitinous ridges and few soft semichitinized flaps (Figs. 7 & 9). Lamella much more long, almost as long as two and a half times as trunk, little curved on proximal portion and bears an upwardly directed sub-basical hook (Figs. 7 & 9).

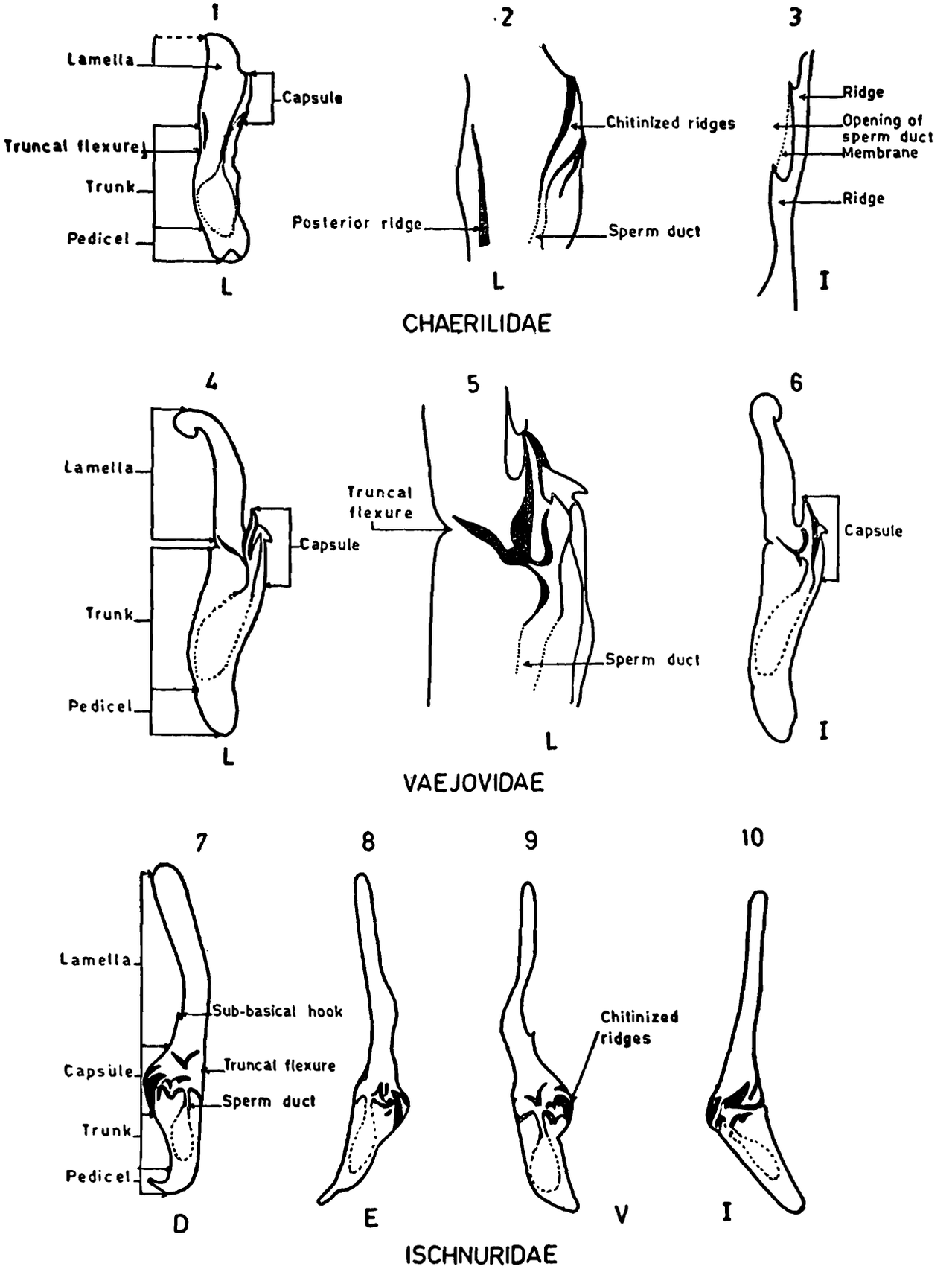

PLATE NO. I :

1. Lateral view, 2. Lateral view of capsular region, 3. Interior view of capsular region of hemispermatophore of *Chaerilus tricostatus* Pocock (Chaerilidae) ;
4. Lateral view, 5. Lateral view of capsular region, 6. Interior view of hemisphermatophore of *Scorpiops* (*Scorpiops*) *hardwickei* (Garvias) (Vaejovidae) ;
7. Dorsal view, 8, Exterior view, 9. Ventral view, 10. Interior view of hemisphermatophore of *Iomachus laeviceps malbarensis* Pocock (Ischnuridae).

DISCUSSION

Indian Scorpio-fauna comprises of five families namely Buthidae, Chaerilidae, Vaejovidae (?), Ischnuridae and Scorpionidae. Amongst these only Buthidae possesses

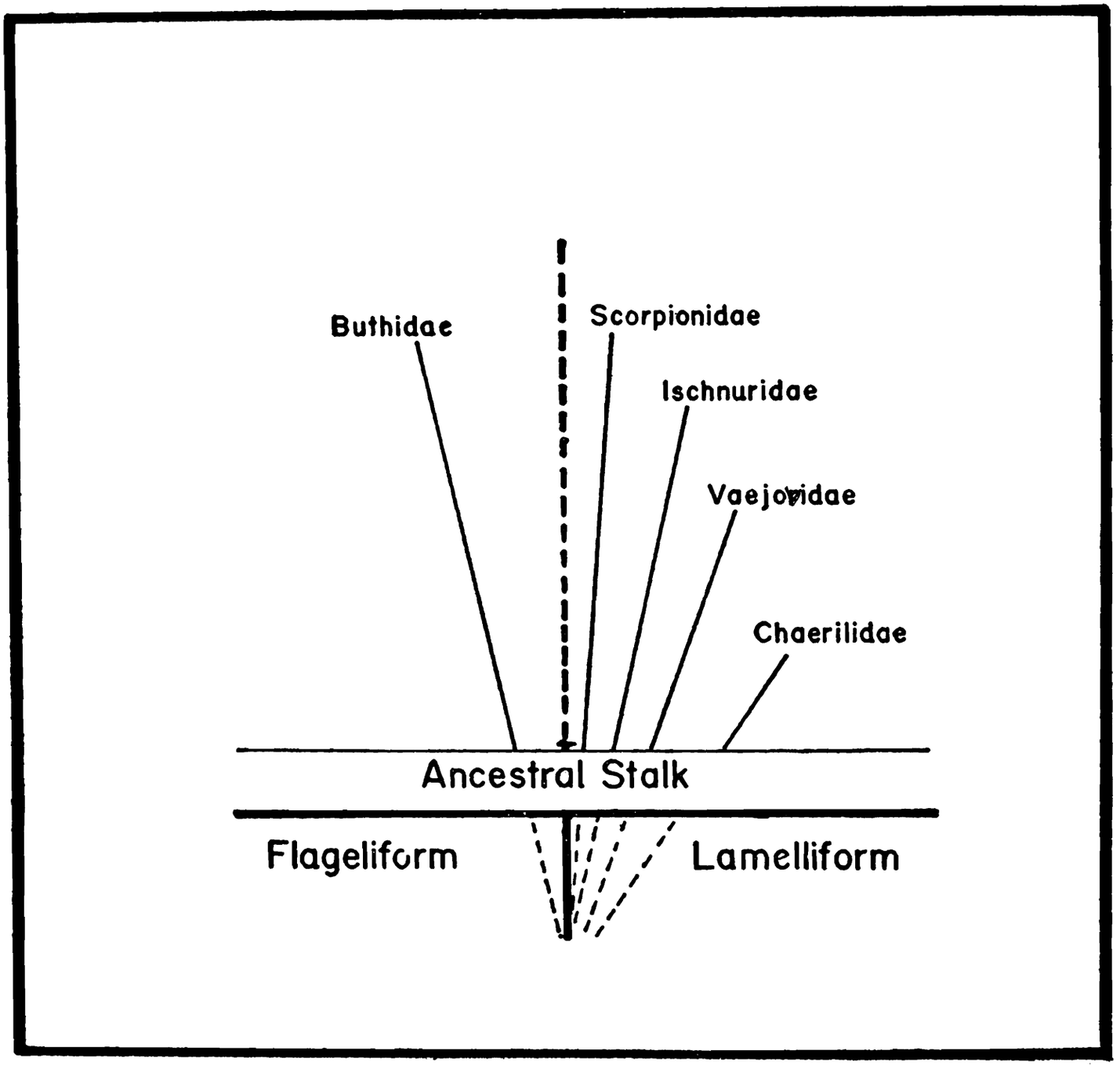

PLATE NO. II

Cladogram showing the phylogeny of different families of Indian Scorpions on the basis of Hemisphermatophores.

a flagelliform spematophore and the remaining families possess the lamelliform spermatophores. The Chaerilid spermatophore is simple, shorter and not curved or bent in the middle whereas these are curved or bent in the case of Vaejovid and Ischnurid. The Vaejovid spermatophore is much more curved than Ischnurid. The spermatophore in case of Ischnurid is longer than remaining two, having longer lamella and shorter trunk and provided with a distinct sub-basal hook. The capsular portion is much simpler in Chaerilid, whereas it much complicated in other two.

The lamelliform spermtophore of chaerilidae shows phylogenetic closeness to remaining chactoid families i. e. Vajeovidae (?), Ischnuridae and Scorpionidae of Indian Scorpions indicating its descendancy from common ancenstral stalk. Whereas the flagelliform buthoid spermatophore shows all together different ancestral stalk (Pt. No. II). The Chaerilid spermatophore has been discussed for the first time and it is observed that the chaerilid spermatophore is morphologically primitive among the chactoid scorpion families.

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