

Unusual structure of the male genitalia in tetrigids of the genus *Saussurella* Bol. (Orthoptera: Tetrigidae: Batrachideinae)

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For the first time, important divergences from general structure of tetrigids have been found in all parts of the phallic complex of *Saussurella*.

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The male genitalia of tetrigids are characterised by a very simple and uniform structure, as compared to those of other orthopteroid insects, and for this reason they are till now not used for taxonomic purposes.

The phallus lies in the cavity of the subgenital plate, which is covered above by the pallium. Usually, the exposed dorsal part of the pallium forms a long valve-like flap containing two sclerotised elongate plates (Figs 1-3), which are separated by a median membranous line (median groove). At rest, the lateral margins of these plates are joined to the margins of the subgenital plate and the whole membranous organ is completely defended by sclerotised structures.

The whole phallic organ is membranous; its lateral walls contain two sclerotised plates, which converge and unite anteriorly forming a single arch with median spines (Figs 2, 3, 5). According to Walker (1922), this sclerite represents the epiphallus ("pseudosternite") of the Acrididae. Harz (1975) and Nadig (1991) followed him, but Snodgrass (1935) did not identified it with the epiphallus of the Acrididae and did not used this name because "the attachment of the ejaculatory muscles upon them would make it seem more probable that they are external representatives of the invaginated endophallic plates of the Acrididae." Between the lateral plates is a large, widely open, membranous cavity, into the bottom of which the ejaculatory duct opens anteriorly.

In the family Tetrigidae, the male genitalia have been best studied in the subfamily Tetriginae. The scheme of their structure was described in *Tetrix ornata* (Say), *T. subulata* (L.) (= *Acrydium granulatum* Kirby), *Paratettix cucullatum* (Burm.) (Walker, 1922), *T. subulata* (L.) (Podgornaya, 1977, 1983), *Mishtshenkotetrix trans-*

sylvanica (Baz. & Kis) (Nadig, 1991). In all the studied species of this subfamily, there are two sclerotised plates on the dorsal surface of pallium. Between these plates, there is a pair of rods terminating anteriorly in small hooks (Figs 1, 2). Very slender sclerites in the lateral walls of the phallic organ converge and unite anteriorly. The median part of this single sclerite is armed by very small spines (Fig. 2). Harz (1975) published drawings of this sclerite in 13 European species from 4 genera; they do not differ essentially in their shape. Thus, the structure of the male genitalia in the subfamily Tetriginae is uniform and cannot be used for taxonomic purposes at the species and generic level within this subfamily.

Apart from tetrigids of the subfamily Tetriginae, only the genitalia of *Tettigidea lateralis* (Say) (subfam. Batrachideinae) have been studied (Walker, 1922; Snodgrass, 1935). Its genitalia differ insignificantly from these of Tetriginae, as described below. The exposed dorsal part of the pallium forms two elongate plates, which are divided by a median membranous suture (Fig. 3). Two slender rods, terminating anteriorly in a pair of small hooks, are absent here. Sclerites in the lateral walls of the phallic organ converge and fuse anteriorly forming a median process armed with small spines (Figs 3, 5). Behind and between the lateral sclerites, there are two thin and plane plates, which curve inward and terminate on each side of the genital aperture (Fig. 5).

In the subfamily Batrachideinae, I have yet studied the male genitalia of two species, viz. *Saussurella cucullifera* Walk. and *S. inelevata* Podg., distributed in Southeast Asia. The phallic complex of both species of the genus *Saussurella* Bol. differs very strongly from that in all other studied tetrigids, especially in the absence of a

pair of plates on the dorsal surface of pallium and specific structure of sclerites in the wall of the phallic organ. The pallium is more firmly sclerotised, its dorsal surface has no two plates and forms above only a single, very large, strongly sclerotised plate, which bears two high longitudinal elevations united anteriorly and divided by a median longitudinal depression (Fig. 6). The phallic organ is strongly sclerotised too. Sclerites in its lateral walls are very large and wide plates, which fuse anteriorly forming a single large, wide, curved sclerite encompassing the whole anterior half of the organ. Anterior part of this sclerite bears above a very large, hollow median process and below a spine and two deep excisions (Fig. 7). Between lateral plates of this sclerite, there are two narrow, long, rod-like sclerites, which stretch backward and fortify the whole upper margin of the organ. Anterior ends

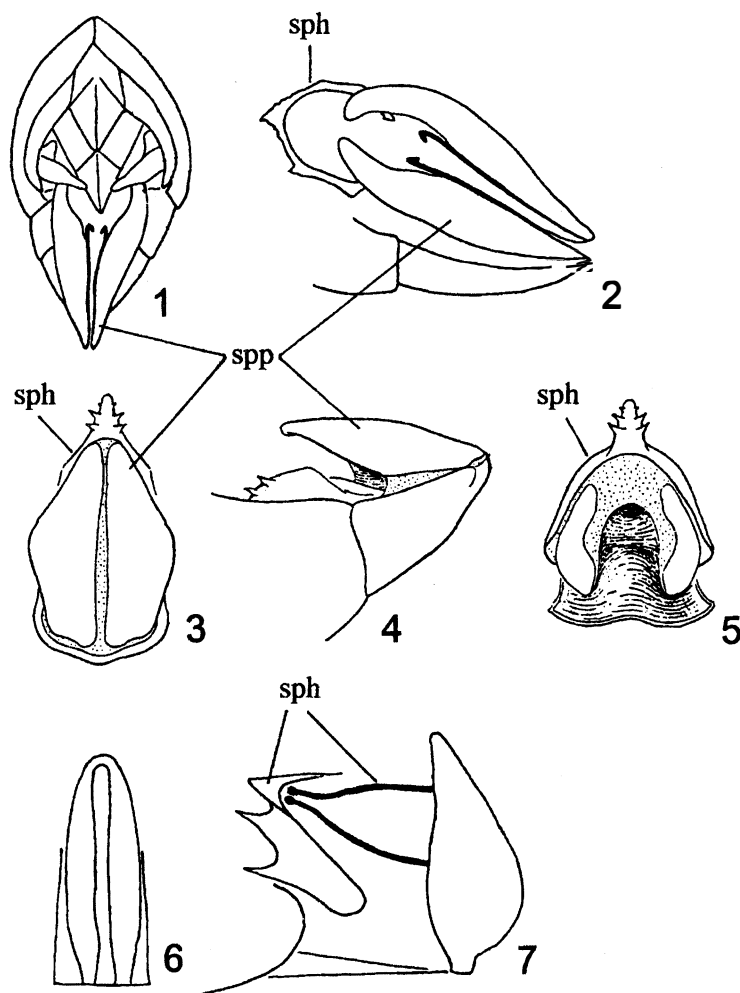
of these sclerites are slightly widened globe-like and inserted into a cavity of the hollow process of the wide sclerite described above. These narrow sclerites are absent in all tetrigids studied till now.

Thus, for the first time important divergences from general structure have been found in the structure of all parts of the phallic complex of tetrigids.

References

- Harz, K. 1975. *Die Orthopteren Europas II*. 939 p. The Hague: W. Junk. (Ser. Entomol., 11).
- Nadig, A. 1991. Ein zoogeographisch bemerkenswerter Fund: *Mishtshenkotetrix transsylvanica* (Bazyluk et Kis, 1960) in Slowenien. *Articulata*, 6(1): 31-34.
- Podgornaya, L.I. 1977. Morphological peculiarities of tetrigids (Orthoptera, Tetrigidae) as compared to Acrididae. *Trudy vsesoyuz. entomol. Obshch.*, 58: 49-60. (In Russian).
- Podgornaya, L.I. 1983. The orthopteran insects of the family Tetrigidae (Orthoptera) in the fauna of the USSR. *Trudy zool. Inst. Akad. Nauk SSSR*, 112: 1-95. (In Russian).
- Snodgrass, R.E. 1935. The abdominal mechanisms of a grasshopper. *Smithson. miscell. Collect.*, 94(6): 1-89.
- Walker, E.M. 1922. The terminal structures of orthopteroide insects: a phylogenetic study. *Ann. entomol. Soc. Amer.*, 15(1): 1-76.

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Figs 1-7. Phallic complex and its details. 1, 2, *Tetrix subulata* (L.), end of abdomen (after Podgornaya, 1983): 1, dorsal view; 2, lateral view with raised genitalia; 3-5, *Tettigidea lateralis* (Say) (after Snodgrass, 1935): 3, pallial plates and anterior process of phallic organ; 4, end of abdomen, lateral view; 5, phallic organ, dorsal view; 6, 7, *Saussurella cucullifera* Walk.: 6, sclerotised plate of pallium, dorsal view; 7, phallic organ, lateral view with raised plate of pallium. *spp*, sclerotised plate of pallium; *sph*, sclerites of phallus.