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C. J. Drake  
_Iowa State College, Ames, Iowa_

F. C. Hottes  
_Iowa State College, Ames, Iowa_

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STRIDULATORY ORGANS IN SALDIDAE (HEMIPTERA)

By C. J. Drake and F. C. Hottes

In the course of clearing and mounting different parts of the body of various species of Saldidae for morphological study, it was noted under the compound microscope, that the anterior end, on each side, of the second visible connexival segment of the male bears a series of either 'peg-like' or "spine-like" organs. These peculiar structures appear to be stridulatory in function. Hitherto, stridulatory structures seem to have been entirely overlooked in the family. Sound-producing organs have not been found in female specimens.

The present paper presents a preliminary account of the stridulatory organs in shore bugs of the family Saldidae; it also calls attention to peculiar modifications of the hemelytral vein and metapleuron for holding the wings rigid in a resting position.

The authors are indebted to Mrs. E. H. Froeschner for making the drawings.

Morphological examinations have been made of more than 100 species of saldids from widely separated regions of the world. Stridulatory pegs or spines have been found in the males of all species studied in the following genera: Saldula Van Duzee, Salda Fabricius, Calacanthia Reuter, Chiloxanthus Reuter, Chartoscirta Stal, Halosaldia Reuter, Ioscytus Reuter, Lampracanthia Reuter, Micracanthia Reuter, Teloleuca Reuter Pentacora Reuter and Saldoidea Osborn. As only a single example of the old world genus Omania Horvath was available for study, it was not dissected. The rare genus Orthophyrus Horvathi is unknown to the authors. In two species examined of the shore bug family Leptopodidae, no stridulatory structures were found.

Two other singular structures also seem peculiar to saldids. Near the base, on the underside, of each hemelytron, in both males and females, the median vein is suddenly enlarged and then deeply obliquely notched (fig. 1, e and f. and fig. 2 a) at the middle of the abruptly thickened part. This notch was found to be present in both hemelytra of the genera studied as listed under the foregoing paragraph. In addition, the pleura of the metathorax bear a small raised roughened area in line with the respective hemelytral notch. This raised "bump" and the notch working together serve to hold the hemelytra in a more rigid and stable position when the insect is not in flight.
Fig. 1. Stridulatory organs of male Saligidæ: a, left connexival segment of *Chiloxanthus pilosus* (Fallen); b and b', left connexival segment and enlarged peg of *Micrancanthia humilis* (Say); c, right connexival segment of *Chiloxanthus stellata* (Curtis); d, left connexival segment of *Saldula balli* Drake; e, Under side of hemelytron showing large subbasal notch in mid-vein; f, *Pentacora signoreti* (Guerin) showing subbasal hemelytron notch on underside of mid-vein near the base.
These structures which are present in both sexes do not appear to be stridulatory in function.

The stridulatory organs are arranged in one or more transverse rows, which curve convexly with the upper part of the front surface of the second visible connexival segment (fig. 1, b, and d, and fig. 2, b.) In general characterized by stridulatory spines, these structures are longer, more numerous and placed in more rows than in genera characterized by pegs (fig. 1, a and c.) As may be observed in the illustrations, both spines and pegs are placed horizontally, directed anteriorly; and, normally tilted somewhat inwardly.

Within a genus, there is a tendency towards a uniform pattern in arrangement, size and shape of both pegs and spines. In such genera as Chiloxanthus, Pentacora and Salda, the connexival stridulatory organs exhibit rather marked generic differences.

The manner in which the stridulatory organs function in nature has not been observed. The posterior margin of the preceding connexival segment is hardened and plate-like with a roughened surface. This probably functions as a rasping organ in conjunction with the pegs or spines. The connexival segments are capable of limited movement.
The pegs (fig. 1, b and d) may be arranged in one or two rows for part of the way, and then an additional row for part, or even the remainder of the distance. Generally speaking, the pegs are alternately arranged in the rows as alternateness in parallel rows places them closer together than oppositeness.

Occasionally, however, some of the pegs may be found opposite each other in the rows, and slight variation in size and arrangement occur within a species, even on opposite sides of the same specimen. As a rule, the pegs nearer the outer margin of the row are shorter, and blunter than those within. Sometimes the inner most pegs are followed by a few stiff spine-like hairs. As a rule the inner most spines or pegs are more tilted inwardly, but remain in a horizontal position. As the spines are more numerous than pegs, they exhibit greater variation in size and especially numbers, (fig. 1, a, and c) within a species. It is often difficult to count the spines, on account of numbers and arrangement. Under the oil emersion lens, the surface of the spines appears smooth, whereas the surface of the pegs is longitudinally striated (fig. 1, b' and d').