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Classification of Hemiptera.

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Authors are by no means agreed as to the exact limits of the order *Hemiptera* or rather as to the number of groups to be included in this varied order. Neither are they agreed as to the natural affinities or the relative rank of the groups and sub-groups they place in it.

Mr. P. R. Uhler, our best American Hemipterist includes in the group only the *Heteroptera*, *Homoptera* and *Parasita*, excluding the *Mallophaga* and the *Thysanoptera*; these latter groups have been included by many authorities and Mr. Packard still maintains on embryological grounds that they should be included.

This being the condition, and as many more observations both embryological and morphological seem necessary to definitely settle the question at issue, we are forced to content ourselves with systems more or less artificial.

In undertaking to present a synoptical arrangement of the group therefore, I shall not consider it in place to discuss these doubtful matters, but simply endeavor to present in condensed form what seems to me the most natural grouping, and that which will afford students the most ready means of arranging their collections.

I have followed most nearly the arrangement given by Mr. Uhler in his chapter on Hemiptera in the "Standard Natural History" but am indebted also to the works of Westwood, Packard, and others. While I have verified all points possible, I have in many instances been obliged to rely upon various authorities, well aware that the discovery of new species must frequently modify the definition of the groups to which they naturally must be referred, and while finding occasion to introduce occasional characters in separating the families, based on observations of

the material in my own hands, it would of course be useless and out of place to attempt to designate such portions, since originality can not be claimed for any such work, though the author may rightly be held responsible for presenting the matter as a whole.

The arrangement given is in descending order, but it will be impossible to follow this in the order of giving the generic synopses.

Including the *Mallophaga* and the *Thysanoptera* (*Physapoda* of Packard) we have no comprehensive definition of the group. Excluding these, we may say the *Hemiptera* include those insects provided with a rostrum or beak formed from the labium and enclosing four extensile setæ which form a sucking tube, along with wings usually four in number which are either all membranous, or the fore ones partially or entirely coriaceous. (In *Coccitæ* there are two in the males only, and in some other groups they are absent or rudimentary in one or both sexes.)

This group which we may call *Hemiptera genuina* is clearly divided by the position of the head and the structure of the wings into two sub-orders, the *Heteroptera* and *Homoptera*.

A third sub-order, *Parasita*, includes the suctorial lice infesting mammals, these apparently having about equal affinities for the two other sub-orders, but combining with neither in being wingless and the beak not jointed.

The other groups are at present most conveniently grouped here, and may be ranked also as sub-orders though structurally there can be little question that they must bear a more distinct relation to the *Hemiptera* proper.

The *Thysanoptera* (or *Physapoda*) are minute insects usually less than 2 millimeters in length; with four very narrow delicately fringed wings which lie flat on the back, with free palpigerous mouth parts, and tarsi without claws; the terminal joint being vesicular.

The *Mallophaga* are wingless parasitic insects living on birds or mammals, with free biting mouth parts, antennæ of three to five joints and presenting some resemblance to the wingless Psocidæ, and by some authors grouped with the Pseudo-Neuroptera.

It is intended to include in these synopses only the North American genera, and the tables must not be considered as applicable in a larger range. The characters also, here mentioned are those of most importance as related to the groups to be here included.

Perhaps in no other order of insects is there such diversity of modification in the several structural elements, and this diversity is accompanied with extreme lack of constancy, so that the clear definition of groups is rendered difficult.



1887. "a: Notes upon certain Pyralidae." *Entomologica Americana* 3, 21–22.

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