CHAETOTAXY AND SPECIALIZED SENSORY ORGANS OF THE EREYNETIDAE *

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Recently I made a study of the chaetotaxy and some of the specialized sensory organs in the family Ereynetidae. By specialized sensory organs I mean primarily the solenidions, the sensillae, and the small enigmatic organ on the tibia I designated as the " ereynetal organ ". The purpose of this study was a better understanding of the phylogeny of these mites and the establishment of their proper classification.

The interesting family Ereynetidae is particularly suitable for the study of evolution because it contains both free-living species as well as parasites of several kinds of animals. All the parasitic forms inhabit exclusively the respiratory tract of their host and apparently feed on mucus. Several species have been described from the lungs of various terrestrial snails. In the nasal cavities of the batrachians there occur 9 species belonging to 2 genera. In birds there are 42 species belonging to 5 genera. In mammals we find 10 species grouped in 3 genera. Of these, rodents are parasitized by 5 species, bats by 3 species, and lemur, apes and cattle by one species each. A brief review of the most important features revealed by this study follows.

I. Ereynetal organ (FAIN, 1962a and b)

This organ is located on tibia I. It is a small pocket, pyriform or ovoid in shape, with slightly sclerotized walls. The distal pole of the pocket ends in a long and very narrow chitinous canaliculus of variable length which opens in a small depression on the dorsal surface of the tibia. Inside this depression or very near to it is a specialized seta of variable length, apparently belonging to the same organ. Near this specialized seta there occurs always an ordinary seta similar to other setae on the tibia.

The function of this organ is unknown, but its particular structure (external

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specialized seta, possibly a receptor, and an internal pouch probably containing a nervous analyzer) suggests that it may be involved in the hearing process.

This organ is present in all the species of Ereynetidae but is consistently absent in all the other families of Trombidiformes we have examined (i.e., Tydeidae, Bdellidae, Eupodidae and Rhagidiidae). It is, then, a characteristic structure of the family Ereynetidae and shows indirectly that this family is homogeneous and probably a natural group, hence the name " ereynetal organ ".

II. Solenidions (FAIN, 1963a)

The solenidions are located on the tarsi of legs I and II and on the palps. Each of these segments bears only one solenidion. The leg solenidions are located on the dorsal surface of the tarsi and are present in all the species.

On tarsus I the solenidion is always external and vertically or obliquely erected, whereas on tarsus II it may be partially or completely sunken inside the article. This latter disposition is observed in the most evolved species of the Speleognathinae. The leg solenidions are generally situated at a certain distance from the base of the tarsus but in the most evolved species the solenidion of leg II may be displaced toward the base of the tarsus.

A solenidion usually is also present on the palps. It is generally situated on the tarsus but in the most primitive genera such as *Ereynetes* or *Ereynetoides* which have a very small palpal tarsus the solenidion is borne by the tibia. The palpal solenidion is absent in some species. Its absence has been observed both in the primitive free-living forms as well as in the parasitic and highly evolved forms.

III. Sensillae (FAIN, 1963b)

In the free-living species of Ereynetidae as well as in the parasitic forms from snails and batrachians there are two pairs of sensillae. One occurs on the propodosoma, the other on the posterior part of the opisthosoma. In species parasitizing warm-blooded hosts the posterior pair of sensillae is replaced by setae similar to the other setae of the body.

In the Ereynetidae the sensillae are long, slender and shortly barbed. In the Lawrencarinae they are long and nude. Their form in Speleognathinae is very variable not only from genus to genus but also from species to species. In the genus *Boydaia* for instance, one can observe all the intermediate forms ranging from narrowly cylindrical to globulous.

IV. Other specialized sensory organs

Besides the ereynetal organ, the solenidions and the sensillae one also finds in the Ereynetidae several other types of specialized sensory organs. Among

these are the so-called " genital suckers ". These small structures are located in the genital lips and are probably sensory in function. They are well developed in the Ereynetinae. In the two other groups they are vestigial or lacking completely.

V. The chaetotaxy proper (FAIN, 1963b and c)

Comparative study of chaetotaxy in the three subfamilies of Ereynetidae has shown that there is a very progressive reduction in the number of setae in relation to the endoparasitic manner of life. Species parasitic on vertebrates have a more reduced setal pattern than those living in the lung of snails. The latter, on the other hand, have a more reduced setal pattern than the free-living species. As a whole, the aspect of chaetotaxy in a group reflects rather well the degree of the group's adaptation to the parasitic manner of life. Also, the reduction of the number of setae is generally related to the simplification of several other characters (e.g., the reduction in the number of palpal articles, the disappearance of the palpal solenidion, etc.).

The shape and number of setae are characters that can be utilized in systematics. Some genera have a characteristic setal pattern and many species can be differentiated on chaetotaxy alone. Up to now the species of genus *Boydaia* could be separated with certainty only on the basis of their larval characters. With the aid of chaetotaxy it is now possible to recognize many species from adults only.

The chaetotaxy of larvae and nymphs furnishes interesting evolutionary data. Post-embryonic development differs in the 3 subfamilies. In the Ereynetinae there are 3 types of nymphs : protonymph, deutonymph and tritonymph ; in the Lawrencarinae, only the protonymph and the deutonymph are present ; in the Speleognathinae the nymphal stages are completely absent. In the last group the adult develops directly within the larval skin (FAIN, 1963b).

Most of the parasitic species exhibit neoteny. As a matter of fact, the number of setae in the adult specimens is always more reduced in the Speleognathinae than in the Ereynetinae, while in the larvae of these groups, the chaetotaxy is identical or nearly so. As an example of such neoteny, *Boydaia trochila* adults and the larvae have the same number of setae on nearly all the leg segments and on the body (FAIN, 1963b).

Until now it has not been possible to differentiate the sexes in the Ereynetidae with certainty. The study of chaetotaxy, however, has shown that in all the species of Ereynetinae and in most of the Lawrencarinae the male has one or 3 pairs of barbed setae in the genital vestibule. These setae are not present in the female. In the Speleognathinae these internal genital setae of the male exist only in one species, but in that group, unlike in the other 2, there are some secondary sexual characters in the female (e.g., the thickening of several setae on leg I). These do not occur in the male (FAIN, 1963c).

We may conclude that the study of specialized sensory organs and chaetotaxy

has led to a better understanding of phylogeny and post-embryonic development of this group, and has provided a new basis for its proper classification. At the species level the study of chaetotaxy has pointed out new characters for the separation of closely related forms and for the recognition of the sexes.

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