

## 17. 24. DEUTONYMPHAL DIMORPHISM IN THE GENUS *HERICIA* (ASTIGMATA : ALGOPHAGIDAE)

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### INTRODUCTION

In their book "Systematik und Ökologie der Tyroglyphiden Mitteleuropas", Türk and Türk (1957) described a new species, *Hericia paradoxa*, based on a deutonymph collected from the bark of birch trees near Erlangen, Germany. The etymology of the species reflects the fact that its systematic position posed a paradox. The habitat and the configuration of the apodemes were characteristic of the genus *Hericia*, but, unlike *Hericia*, the sucker plate was extremely reduced and the pretarsi short.

The present study answers Türk and Türk's paradox by describing deutonymphal dimorphism in a new species of *Hericia* that inhabits the sap-flux (= slime flux) of oak trees in the eastern United States. The deutonymph of Türk and Türk was a non-phoretic morph; a morph that has lost most of the attributes associated with dispersal.

### MATERIALS AND METHODS

Specimens of *Hericia* were collected from sap-flux on oak trees (*Quercus*) near Williamsburg, Virginia, during the month of June. Deutonymphs were examined using both phase contrast and Hoffman modulation contrast microscopy as well as scanning electron microscopy (SEM). Mensural data were collected on the idiosomal length and width of the two morphs as well as on a number of characters associated with phoresy. In an attempt to determine the host used for dispersal, insects associated with sap-flux were collected and examined for deutonymphs. Deutonymphs were found on one adult nitidulid beetle, and specimens of this species in the National Museum of Natural History, Smithsonian Institution, were then examined for deutonymphs to corroborate the association.

### RESULTS

The collected samples contained all instars of a new species of the genus *Hericia*, among which were two distinct deutonymphal morphs (Fig.1). Although the morphs do not differ significantly in regard to idiosomal size, there are extensive differences in characters

Table 1. Comparative measurements between morph 1 and morph 2. Means given in micrometers; sample size = 10.

	Morph 1	Morph 2	Probability (t-test)
IDIOSOMA			
Length	270.3	265.6	0.6100
Width	161.4	163.4	0.6300
GNATHOSOMA			
Distance Recessed	22.2	9.2	0.0001
Solenidion	5.1	14.2	0.0001
LEG I			
Length minus pretarsus	77.4	101.7	0.0001
Distance Recessed	47.0	28.5	0.0001
Solenidion $\omega_1$	9.7	11.3	0.0230
Solenidion $\omega_3$	11.5	15.8	0.0001
Solenidion $\varphi$	11.4	30.3	0.0001
Seta <i>d</i>	36.1	52.1	0.0001
LEG II			
Length minus pretarsus	76.1	103.1	0.0001
Distance Recessed	40.3	27.1	0.0004
Solenidion $\omega_1$	10.4	12.8	0.0009
Solenidion $\varphi$	10.8	22.2	0.0001
Seta <i>d</i>	36.3	55.7	0.0001
LEG III			
Length minus pretarsus	56.8	64.2	0.0001
Pretarsus	11.2	27.3	0.0001
Seta <i>d</i>	71.6	115.2	0.0001
LEG IV			
Length minus pretarsus	57.7	64.2	0.0530
Pretarsus	11.2	28.3	0.0001
Seta <i>d</i>	73.7	118.9	0.0001

associated with phoretic behavior (Table 1). One morph (hereafter referred to as morph 1) is lacking or deficient in such characters (Fig. 1a), and the other (hereafter referred to as morph 2) is a typical migratory, entomophilous form, highly adapted for locating and attaching to a host for phoresy (Fig. 1b). The gnathosoma of morph 1 is recessed, with short solenidia that terminate well short of the idiosomal margin (Figs. 2a, 2b)<sup>1</sup>, whereas that of morph 2 is more distally located with long solenidia projecting to and

<sup>1</sup>Figures 2 - 5 on Plates XIX - XXII.

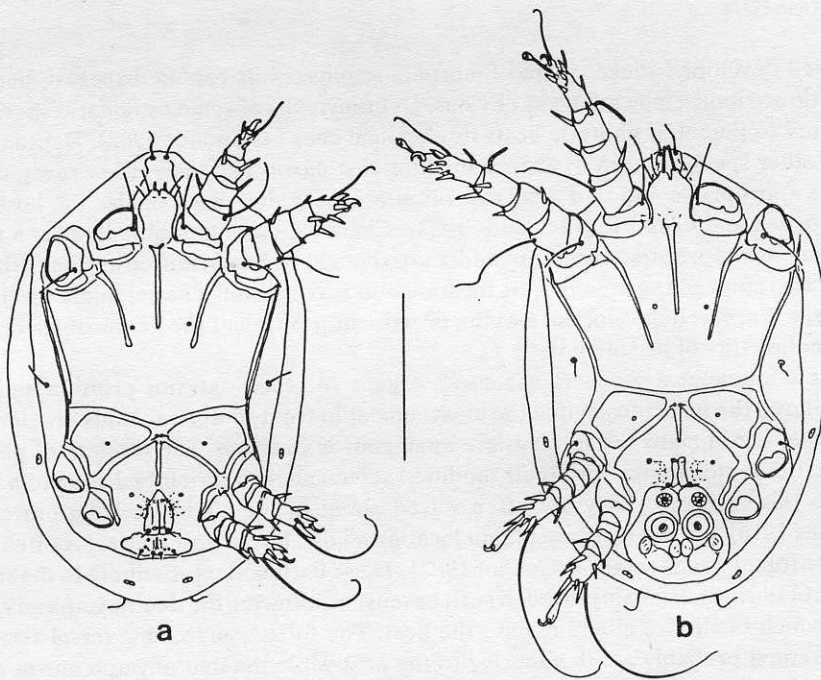


Figure 1. Ventral view of deutonymphs - a - morph 1, b - morph 2. Bar = 100 micrometers.

sometimes beyond the margin of the idiosoma (Figs. 2c, 2d). The anal attachment organ (sucker plate) of morph 2 is well developed with anterior and medial suckers as well as lateral and posterior conoidal setae (Fig. 1b, 3b). In contrast, the anal organ of morph 1 is greatly reduced and devoid of suckers and conoidal setae, the only remnants of which are two pairs of small posterior hairlike setae (homologs of the conoidal setae of morph 1), a pair of anterior vestigial alveoli (homologs of the anterior suckers) and two pairs of medial vestigial alveoli (homologs of the medial suckers) (Figs. 1a, 3a).

The legs of morph 2 are longer than those of morph 1. Legs I and II also originate closer to the idiosomal margin (Fig. 1, Table 1), so that the legs extend much further beyond the idiosoma than those of morph 1 (Fig. 1). The legs of morph 2 also have longer solenidia and tarsal setae *d* than those of morph 1 (Table 1). In addition, seta *e* on tarsi I and II of morph 2 is long and apically expanded (foliate) (Fig. 4b), whereas their homologs on morph 1 are short and unmodified (Fig. 4a). And finally, morph 1 has short pretarsi on legs III and IV, whereas those pretarsi on morph 2 are considerably longer (Fig. 5, Table 1).

Examination of insects collected at sap-flux in the study area produced only one with deutonymphs, an adult of *Glischrochilus obtusus* (Say, 1835) (Coleoptera: Nitidulidae). Examination of museum specimens of *G. obtusus* yielded over 100 deutonymphs, all of which were morph 2.

